



NTDB[®]
NATIONAL TRAUMA DATA BANK

National Trauma Data Bank Annual Report 2007

Version 7.0

Acknowledgments

The American College of Surgeons Committee on Trauma wishes to thank the Health Resources and Services Administration (HRSA), the National Highway Traffic Safety Administration (NHTSA), and the Centers for Disease Control and Prevention (CDC) for their support of the NTDB.

NTDB Annual Report 2007

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Executive Summary

The National Trauma Data Bank (NTDB) is the largest aggregation of trauma registry data ever assembled. It contains nearly 3 million records. The 2007 Annual Report reviews the combined data set for the period 2002-2006, containing 1,485,098 records. The goal of the NTDB is to inform the medical community, the public, and decision makers about a wide variety of issues that characterize the current state of care for injured persons in our country. It has implications in many areas including epidemiology, injury control, research, education, acute care, and resource allocation.

This endeavor is in keeping with the mission of the American College of Surgeons (ACS) Committee on Trauma (COT) which is "To improve the care of the injured through systematic efforts in prevention, care, and rehabilitation."

NTDB Hospitals

- 712 hospitals submitted data to the NTDB for the period from 2002 to 2006, and had records included in the annual report analysis.
- 153 are verified as Level I, representing 78% of Level I centers.
- 175 are verified as Level II, representing 71% of Level II centers.
- 50 are verified as Level III, representing 18% of Level III centers.
- 334 are verified as Level IV, Level V, and unspecified.

Age

- The age distribution of patients in NTDB peaks from ages 16 to 24, primarily representing patients injured in Motor Vehicle Traffic related incidents and by Firearm.
- There is a second peak between ages 35 and 44, primarily representing patients injured in Motor Vehicle Traffic related injuries.
- A third, smaller peak occurs between ages 72 and 85, consisting primarily of Motor Vehicle Traffic injuries and Falls.
- Up to age 70, men account for 65% of incidents. After age 70 most patients are women.

Mechanism of Injury

- Motor Vehicle Traffic related injuries account for 37.9% of cases in the NTDB, with a dramatic rise between age 14 and 24, peaking around age 19.
- Motor Vehicle Traffic and Falls have the highest case fatality rates, at 4.8 and 3.1 respectively.
- Falls account for 30.2% of cases in the NTDB, and deaths due to Falls increase gradually up to the 75 – 84 years of age category.
- Struck By, Against; Firearm; and Transport, Other are the next most frequent categories, representing 6.7%, 5.3%, and 5.3% of injuries, respectively. See Appendix D for details on these injury categories.
- Firearm injuries peak around 19 years of age, and then steadily decrease.

Injury Severity Score

The Injury Severity Score (ISS) is a system for numerically stratifying injury severity. The ISS system has a range of 1-75 and risk of death increases with a higher score. This report categorizes ISS 1-8 as Minor; 9-15 as Moderate; 16-24 as Severe; and greater than 24 as Very Severe.

- Almost half (45.2%) of patients suffer Minor injuries and about one-third (32.4%) have Moderate injuries.
- Case fatality rates increase with injury severity, with the most severe group experiencing a case fatality rate of 29.3.
- Case fatality for all severity levels is higher for patients over age 75.
- Average length of stay (LOS) increases for each consecutive severity grouping.

Payment

- Self-Pay is the second largest payment category at 14.7%, after Other which accounts for 16.6%.

- Medicare is third at 13.3%.
- Managed Care accounts for 9.6%.
- Medicaid accounts for 9.0%.
- Commercial Insurance accounts for 7.4%.

Mortality

- The largest number of deaths is caused by Motor Vehicle Traffic related injuries, followed by Falls and Firearm.
- Motor Vehicle Traffic, Falls, and Firearm injuries have the highest case fatality rates.
- The percentage of death is highest in the group aged 85 and over.
- Firearm deaths rise dramatically from 12 to 20 years, and then decline steadily.

Organ Injuries

- The largest percentage of patients sustained brain/skull and/or extremity injuries. These are not necessarily isolated injuries, so patients could have injuries in multiple organ systems.
- Case fatality rates are highest for those patients with abdominal and/or thoracic injuries.
- For patients with head injuries, the case fatality rate was highest for those with both brain and skull injuries.
- For those with thoracic injuries, case fatality rate was highest for patients with heart or tracheobronchial tree/esophagus injuries.
- Patients with liver, GI tract, or other/unknown abdominal injuries had the highest case fatality rate among those with an abdominal injury.
- Please note that the cause of death for these patients is not known.

Comments

We hope that this document has expanded your understanding of who is admitted to trauma centers in the United States, and why. We further hope that your opinions will be informed by these data, and that you will find ways to share these data with other audiences. Finally, we hope this report has increased your interest to look more deeply at specific problems in the field of injury using the NTDB as a resource. The full National Trauma Data Bank Report 2007, Version 7.0, is available on the ACS Web site as a PDF file and a PowerPoint presentation at <http://www.ntdb.org>.

Editor's Note

The 2007 Annual Report of the National Trauma Data Bank (NTDB), Version 7.0, is an updated analysis of the largest aggregation of trauma registry data that has ever been assembled. The NTDB now contains over 2.7 million records.

This 2007 Annual Report is based on 1,485,098 records from the years 2002-2006. The NTDB uses a rolling 5-year time frame for the annual analysis in order to focus on the most recent, highest quality data. Prior to analysis, NTDB data are subjected to a quality screening for consistency and validity, as described in Appendix C.

The report contains several enhancements versus previous annual reports. There are new tables and figures describing specific organs and organ systems in greater detail than was possible in previous versions. For all body regions, both incidence and case fatality rates are shown, by body organ injured. However, no inferences should be drawn from these data with respect to causality, since the NTDB contains no specific information on proximate cause of death, but only those injuries associated with death. In addition, this year's report includes three new graphs by hospital for different level designation using all the 2006 admission year data. These graphs present the number of records submitted, data completeness and the case fatality rate by hospital for level designation I, II and III or IV. Level designation is defined as ACS verification level or state designation level.

The mission of the American College of Surgeons (ACS) Committee on Trauma (COT) is to develop and implement meaningful programs for trauma care. In keeping with this mission, the NTDB is committed to being the principal national repository for trauma center registry data. We estimate that 78% of Level I and 71% of Level II trauma centers in the United States have contributed data to the NTDB.

The purpose of this report is to inform the medical community, the public, and decision makers about a wide variety of issues that characterize the current state of care for injured persons in our country. It has implications in many areas including epidemiology, injury control, research, education, acute care, and resource allocation.

The NTDB Subcommittee would like to thank all of the trauma centers that contributed data and hope that this report will attract new participants. The full National Trauma Data Bank Report Version 7.0 is available on the ACS Web site as a PDF file and a PowerPoint presentation at <http://www.ntdb.org>. In addition, information is available on our website about how to obtain actual NTDB data for more detailed study.

Many dedicated individuals on the ACS COT, as well as at trauma centers around the country, have contributed to the early development of the NTDB and its rapid growth in recent years. Building on these achievements, our goals in the coming years include improving data quality, updating analytic methods, and enabling more useful interhospital comparisons. These efforts will be reflected in future NTDB reports to participating hospitals as well as in the Annual Reports.

David E. Clark, MD, FACS
Chair, National Trauma Data Bank Subcommittee

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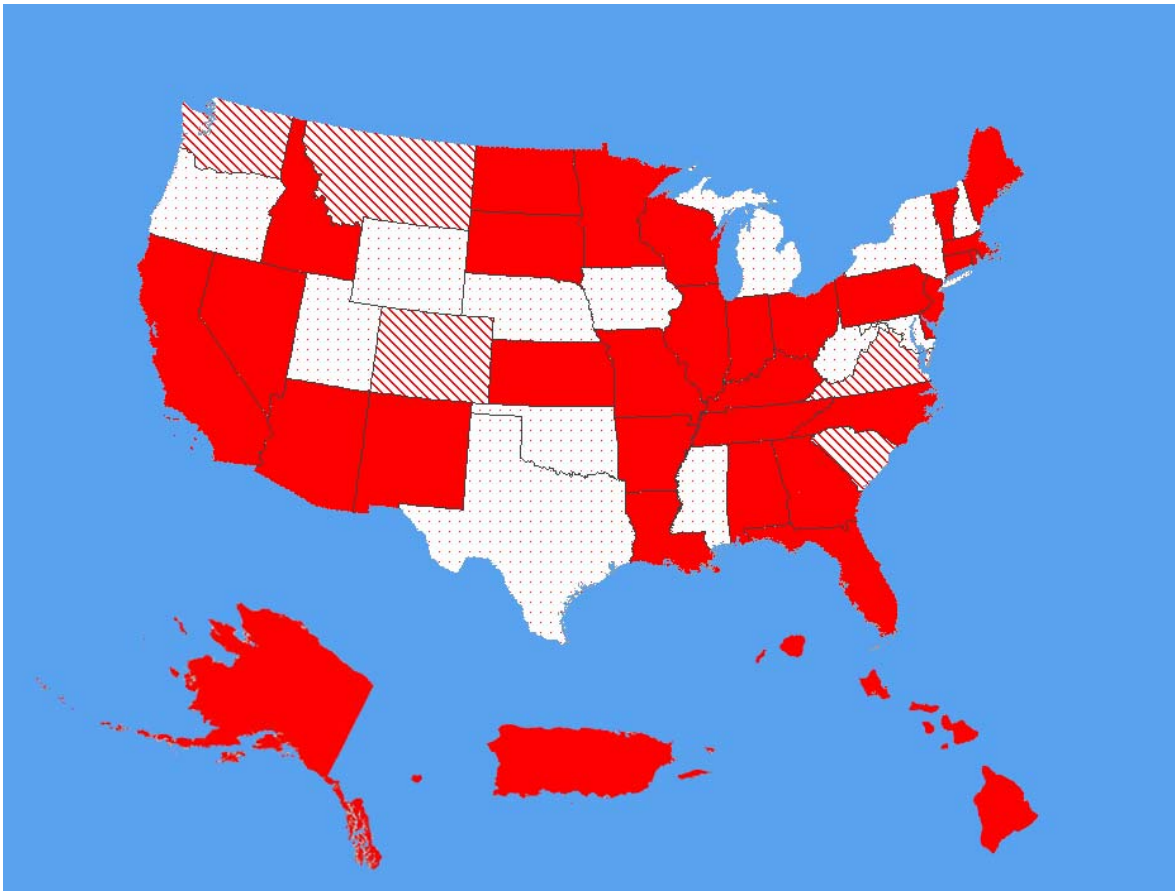


Figure 1 States and U.S Territories submitting data to the NTDB. Number of hospitals in the state that have submitted to the NTDB divided by the number of hospitals identified by the Trauma Exchange Information Program (TIEP) as trauma centers designated by a state or local authority and/or verified by the American College of Surgeons.

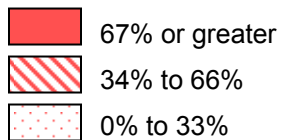


Figure 2A Percentage of hospitals by bed size

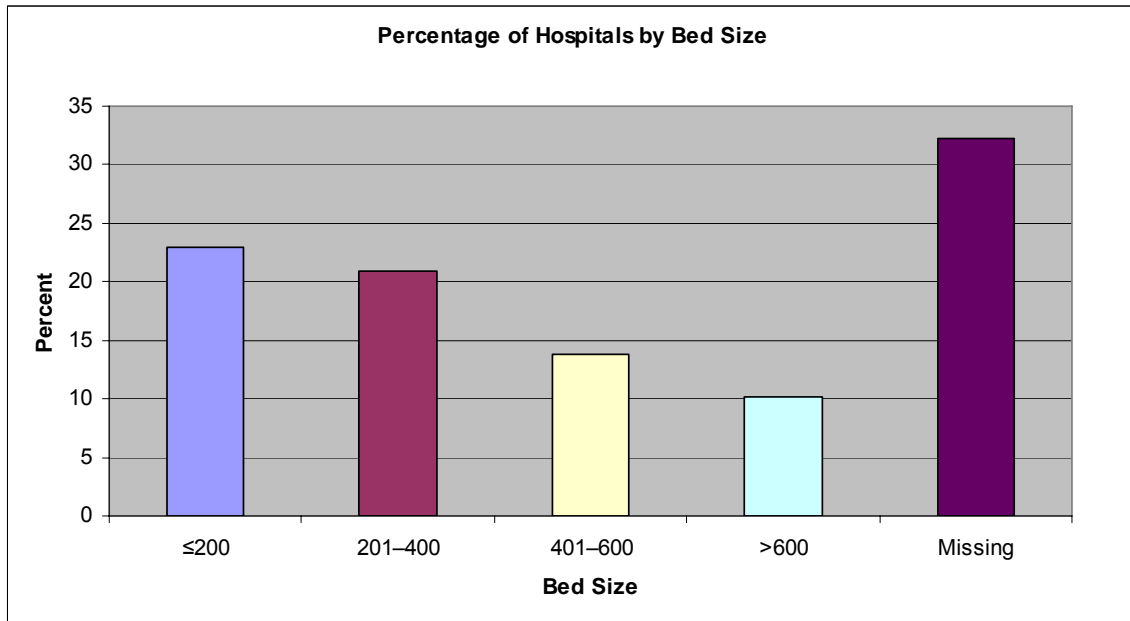


Figure 2A Number and percentage of hospitals by bed size

Bed size	Number Hospitals	Percent Hospitals
≤200	163	22.9
201-400	149	20.9
401-600	98	13.8
>600	72	10.1
<i>Missing</i>	230	32.3
Total	712	

Figure 3A Percentage of hospitals by level of designation

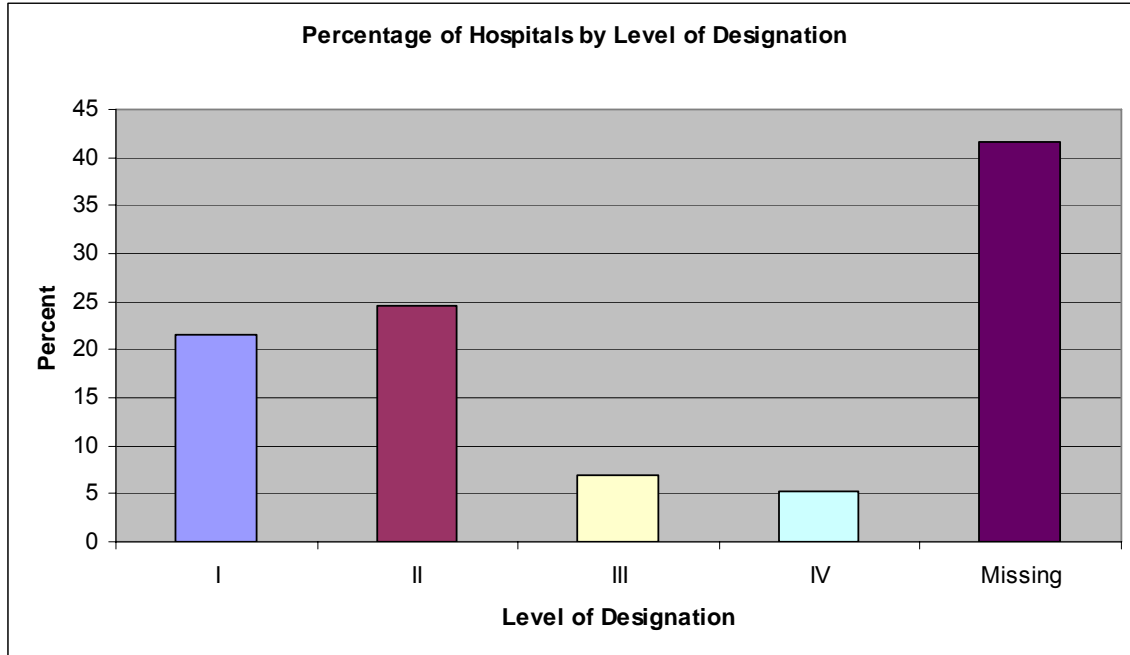
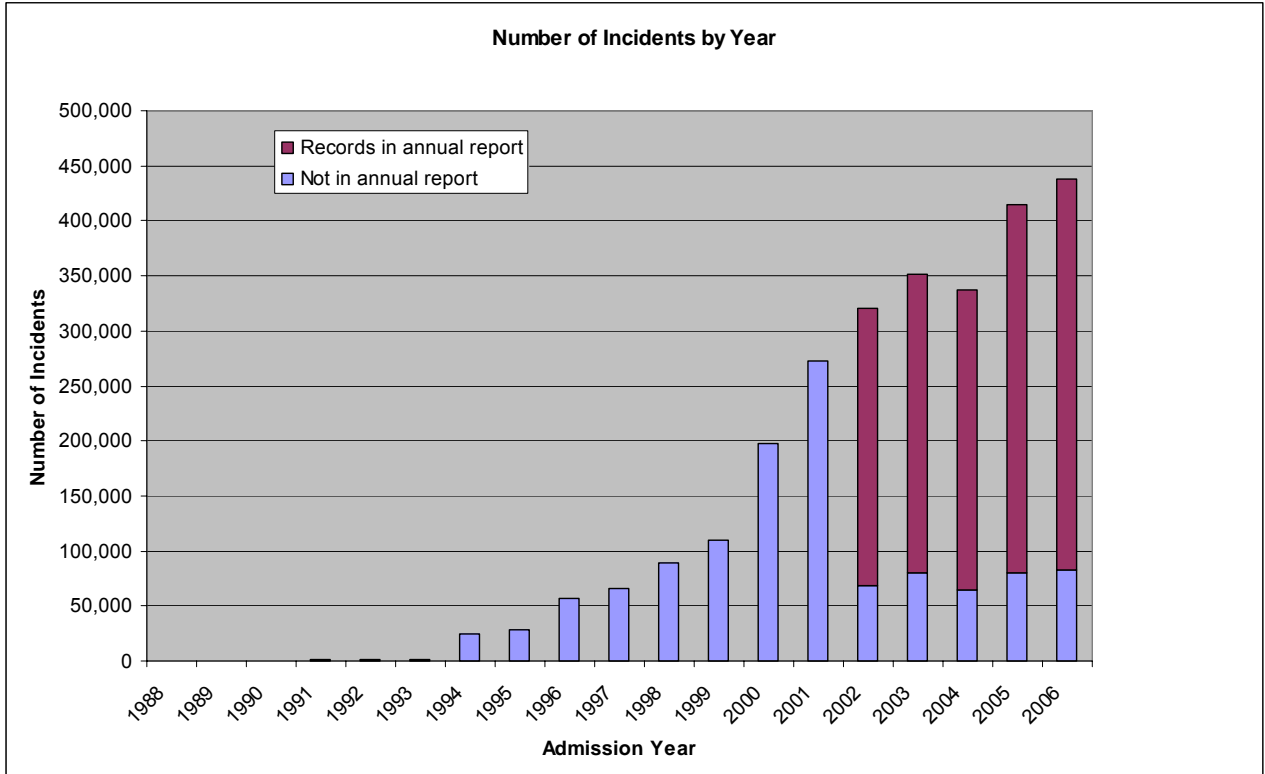


Table 3B Number and percentage of hospitals by level of designation

Level of Designation	Number Hospitals	Percent Hospitals
I	153	21.5
II	175	24.6
III	50	7.0
IV	37	5.2
<i>Missing</i>	297	41.7
Total	712	

Figure 4A Number of incidents by year in NTDB.



Year of Admission	Number of Records in NTDB	Percent of Records in NTDB	Number of Records in Annual Report	Percent of Records in Annual Report
1988 - 2001	849,352	30.7	0	0.0
2002	320,778	11.6	252,281	17.0
2003	351,948	12.7	272,438	18.3
2004	336,669	12.2	271,527	18.3
2005	414,782	15.0	334,302	22.5
2006	437,590	15.8	354,550	23.9
Unknown	58,523	2.1	0	0.0
Total	2,769,642	100.0	1,485,098	100.0

Table 4B

Number of incidents by year in NTDB.

Figure 5A Number of incidents by source of payment

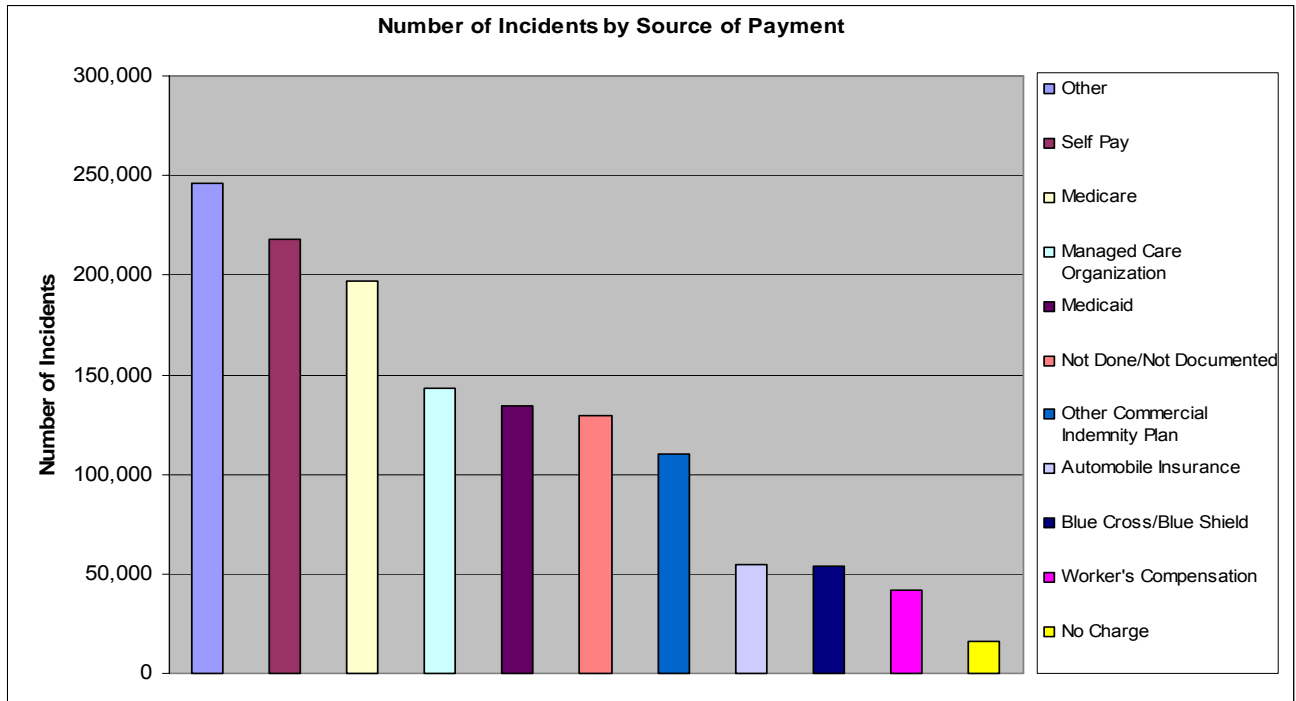


Table 5B Number and percentage of hospitals by source of payment

Payment Source	Number	Percent
Other	246,297	16.6
Self Pay	218,190	14.7
Medicare	196,967	13.3
Managed Care Organization	142,808	9.6
Medicaid	134,122	9.0
Not Done/Not Documented	129,836	8.7
Other Commercial Indemnity Plan	110,162	7.4
Automobile Insurance	54,877	3.7
Blue Cross/Blue Shield	53,649	3.6
Worker's Compensation	41,935	2.8
No Charge	16,346	1.1
None	11,911	0.8
Government/Military Insurance	11,493	0.8
No Fault Insurance	5,181	0.3
CHAMPUS	4,649	0.3
Liability Insurance/Under Litigation	2,922	0.2
MCH and Crippled Children's	1,396	0.1
Pending	1,248	0.1
Private Charity	827	0.1
Organ Donor Subsidy	16	0.0
<i>Missing</i>	100,266	6.8
Total	1,485,098	100.0

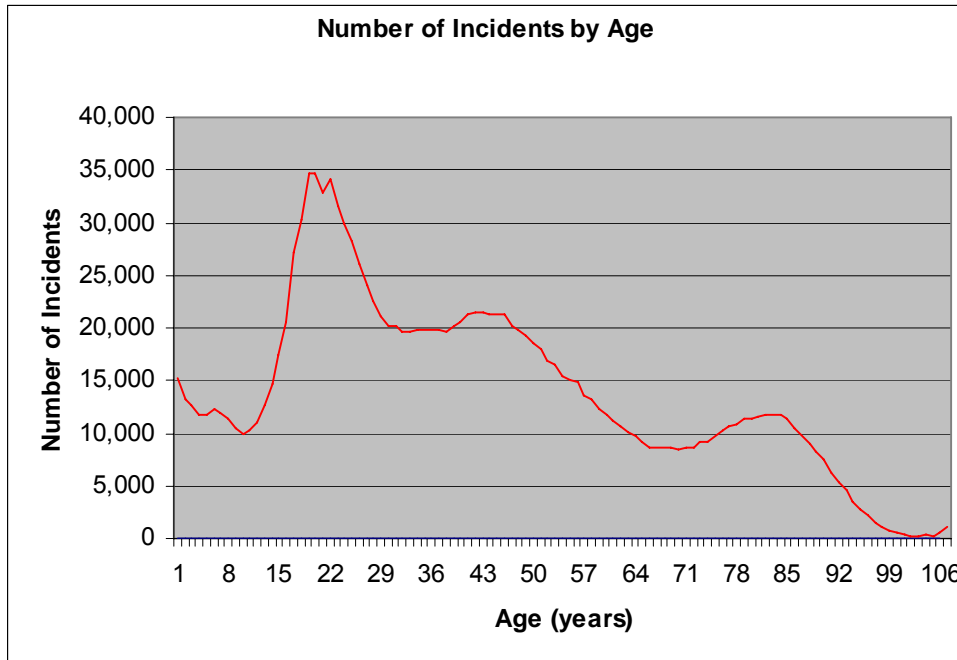


Figure 6A

Number of incidents by age.

Age Range	Number	Percent
<1	15,229	1.0
1-4	49,301	3.3
5-9	56,207	3.8
10-14	66,112	4.5
15-19	147,246	9.9
20-24	156,621	10.5
25-34	213,071	14.3
35-44	206,654	13.9
45-54	180,958	12.2
55-64	116,510	7.8
65-74	88,209	5.9
75-84	112,527	7.6
≥85	76,453	5.1
Total	1,485,098	100.0

Table 6B

Number and percentage of incidents by age.

Figure 7A Number of incidents by age and gender

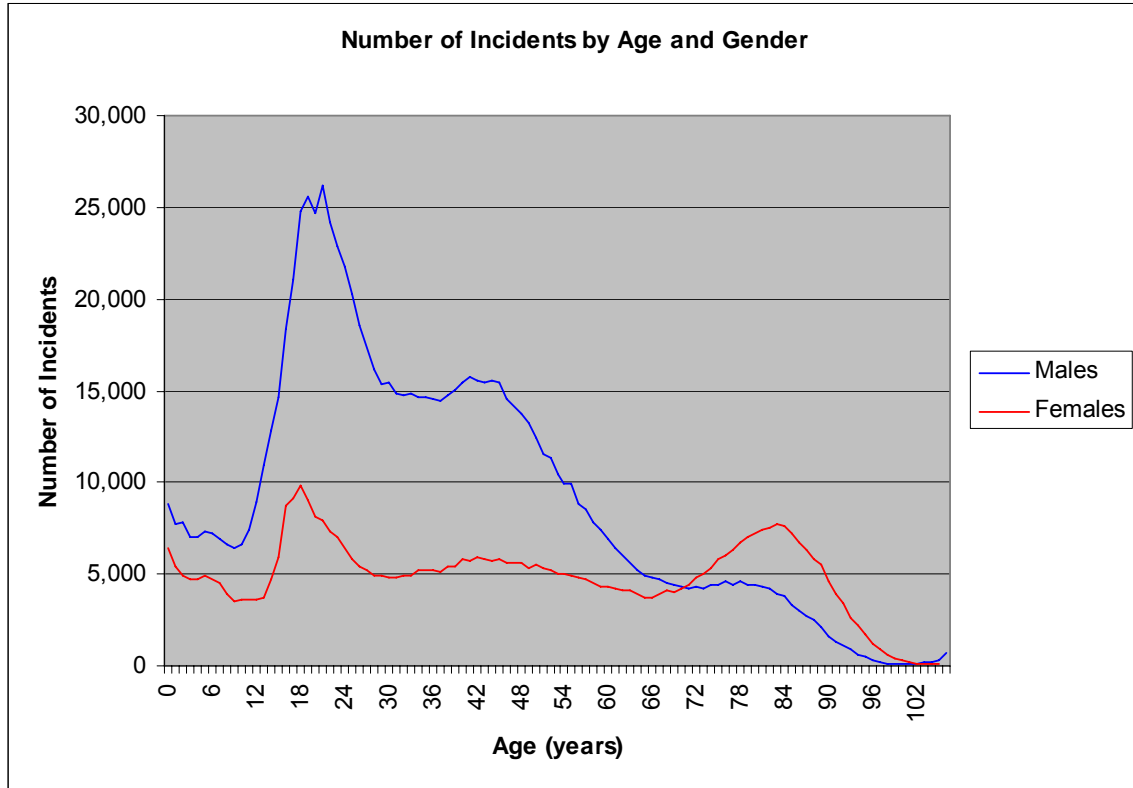


Table 7B Number and percentage of incidents by age and gender

Age Range	Number	Number Females	Percent Females	Number Males	Percent Males
<1	15,229	6,408	1.2	8,821	0.9
1-4	49,301	19,809	3.8	29,492	3.0
5-9	56,207	21,577	4.2	34,630	3.6
10-14	66,112	19,304	3.7	46,808	4.8
15-19	147,246	42,672	8.2	104,574	10.8
20-24	156,621	36,910	7.1	119,711	12.4
25-34	213,071	50,944	9.8	162,127	16.8
35-44	206,654	55,373	10.7	151,281	15.6
45-54	180,958	54,161	10.5	126,797	13.1
55-64	116,510	43,856	8.5	72,654	7.5
65-74	88,209	43,308	8.4	44,901	4.6
75-84	112,527	69,411	13.4	43,116	4.5
≥85	76,453	54,390	10.5	22,063	2.3
Total	1,485,098	518,123	100.0	966,975	100.0

Figure 8A Case fatality rate by age

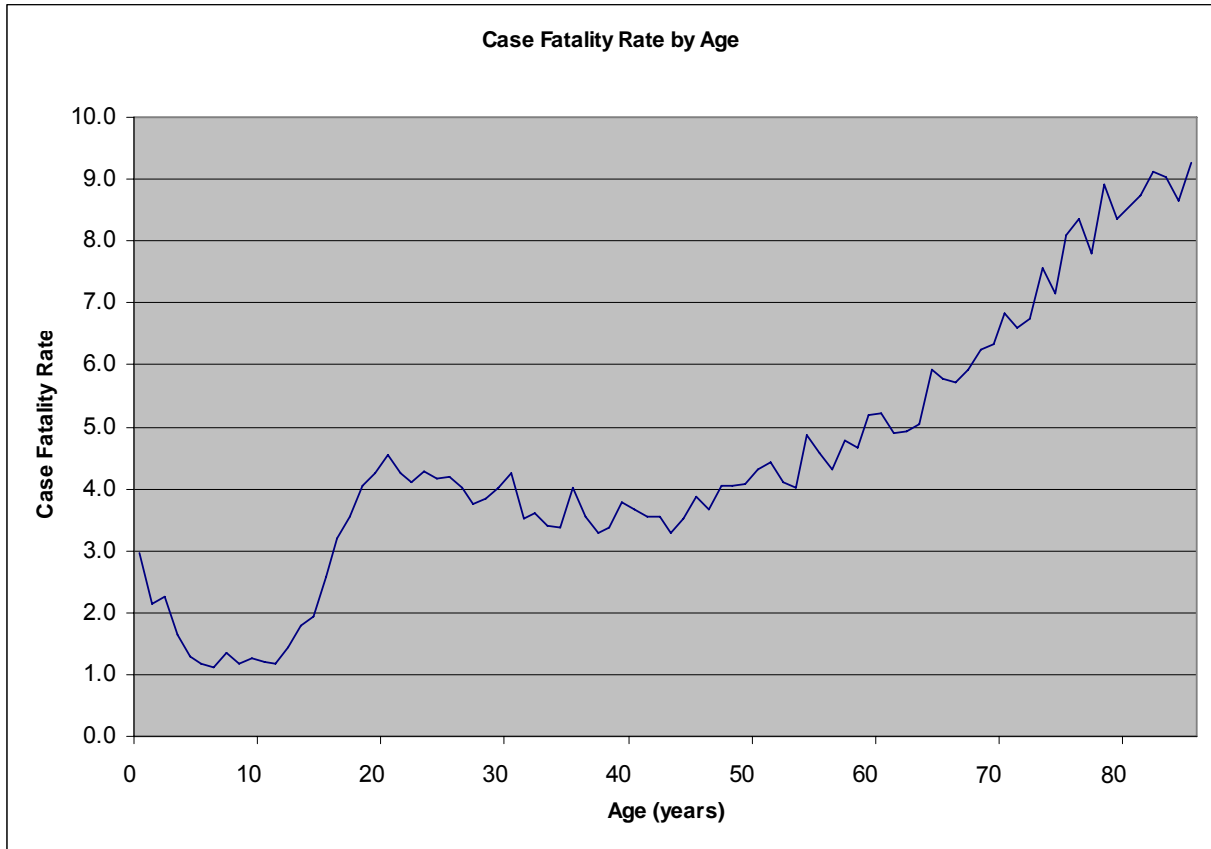


Table 8B Case fatality rate by age

Age Range	Number	Number Died	Case Fatality Rate
<1	15,229	451	3.0
1-4	49,301	908	1.8
5-9	56,207	682	1.2
10-14	66,112	1,038	1.6
15-19	147,246	5,339	3.6
20-24	156,621	6,685	4.3
25-34	213,071	8,122	3.8
35-44	206,654	7,346	3.6
45-54	180,958	7,451	4.1
55-64	116,510	5,717	4.9
65-74	88,209	5,738	6.5
75-84	112,527	9,649	8.6
≥85	76,453	6,771	8.9
Total	1,485,098	65,897	

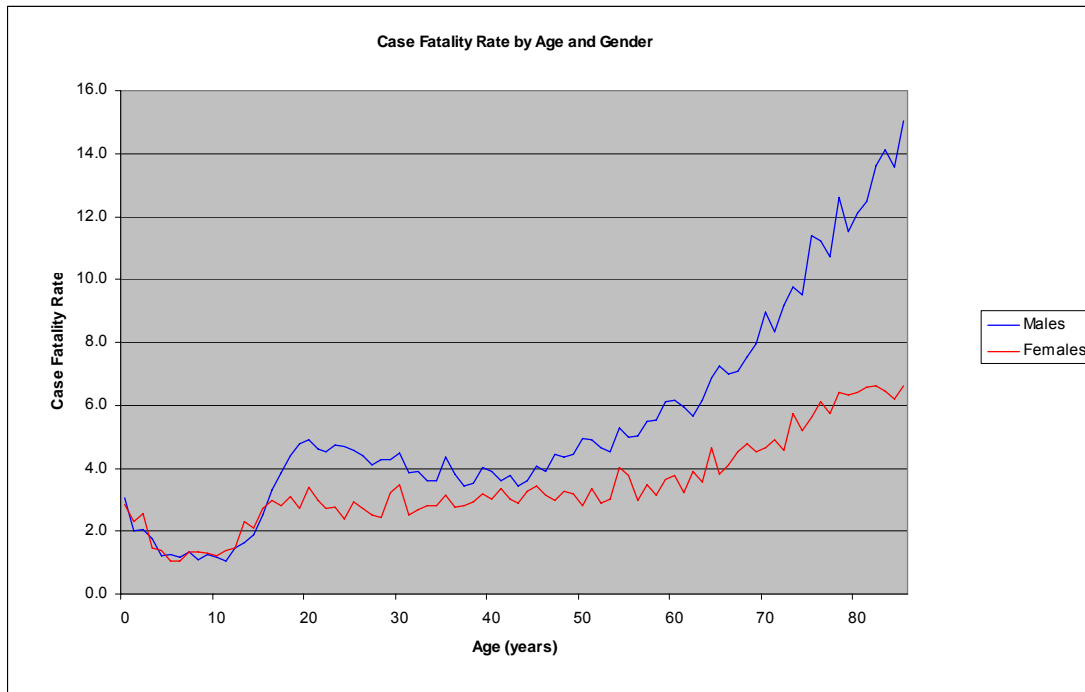


Figure 9A
Case fatality rate by age and gender.

Table 9B Case fatality rate by age and gender.

Age Range	Number Females	Number Female Died	Female Case Fatality Rate	Number Males	Number Male Died	Male Case Fatality Rate
<1	6,408	183	2.9	8,821	268	3.0
1-4	19,809	386	1.9	29,492	522	1.8
5-9	21,577	260	1.2	34,630	422	1.2
10-14	19,304	330	1.7	46,808	708	1.5
15-19	42,672	1,227	2.9	104,574	4,112	3.9
20-24	36,910	1,065	2.9	119,711	5,620	4.7
25-34	50,944	1,430	2.8	162,127	6,692	4.1
35-44	55,373	1,683	3.0	151,281	5,663	3.7
45-54	54,161	1,736	3.2	126,797	5,715	4.5
55-64	43,856	1,574	3.6	72,654	4,143	5.7
65-74	43,308	2,050	4.7	44,901	3,688	8.2
75-84	69,411	4,354	6.3	43,116	5,295	12.3
≥85	54,390	3,632	6.7	22,063	3,139	14.2
Total	518,123	19,910		966,975	45,987	

Figure 10A Number of incidents by mechanism of injury

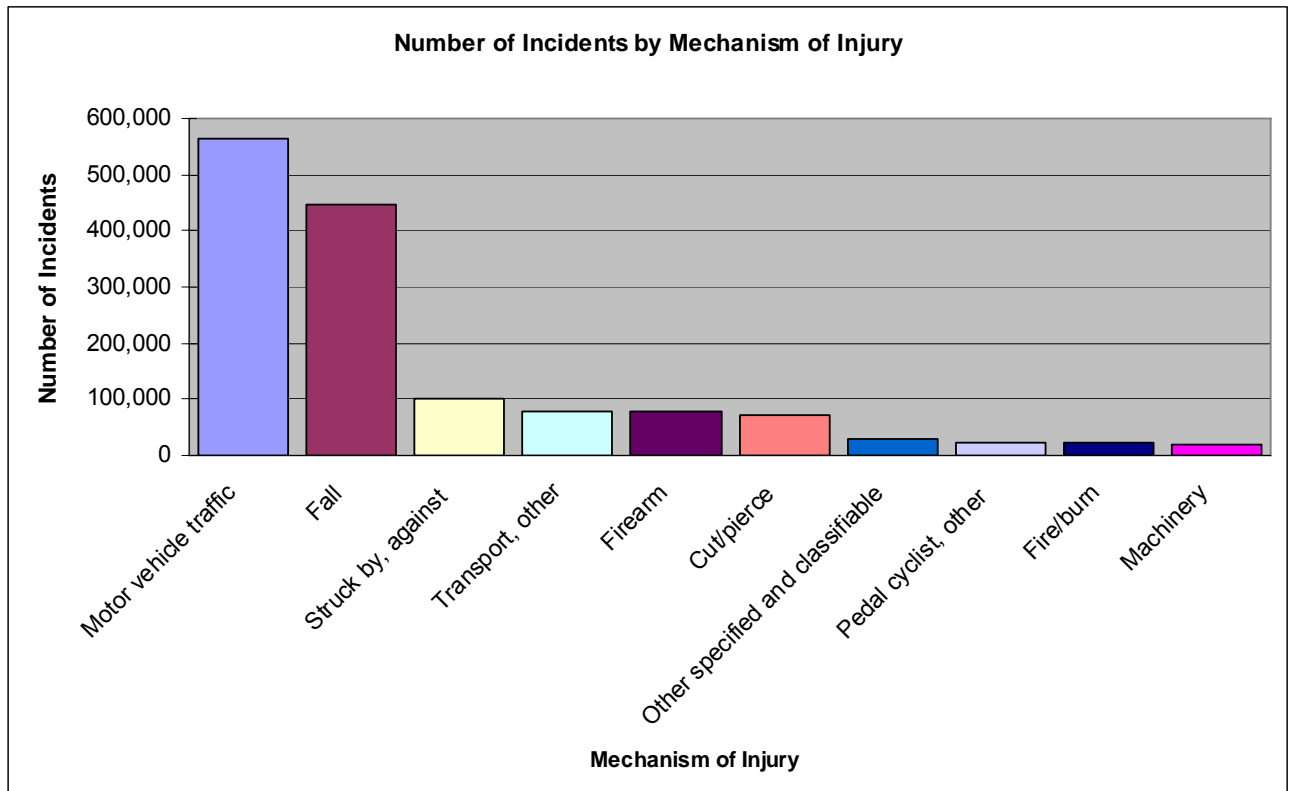


Table 10B Number and percentage of incidents by mechanism of injury (see Appendix D)

Mechanism of Injury	Number	Percent
Motor vehicle traffic	562,820	37.9
Fall	448,258	30.2
Struck by, against	100,104	6.7
Transport, other	79,172	5.3
Firearm	78,447	5.3
Cut/pierce	72,930	4.9
Other specified and classifiable	30,048	2.0
Pedal cyclist, other	22,103	1.5
Fire/burn	21,629	1.5
Machinery	19,409	1.3
Unspecified	18,247	1.2
Natural/environmental	11,678	0.8
Fire/Flame	7,222	0.5
Pedestrian, other	5,227	0.4
Overexertion	4,457	0.3
Suffocation	1,484	0.1
Drowning/submersion	889	0.1
Poisoning	761	0.1
Other natural/environmental	162	0.0
Hot objects	51	0.0
Total	1,485,098	100.0

Figure 11A Number of deaths by mechanism of injury

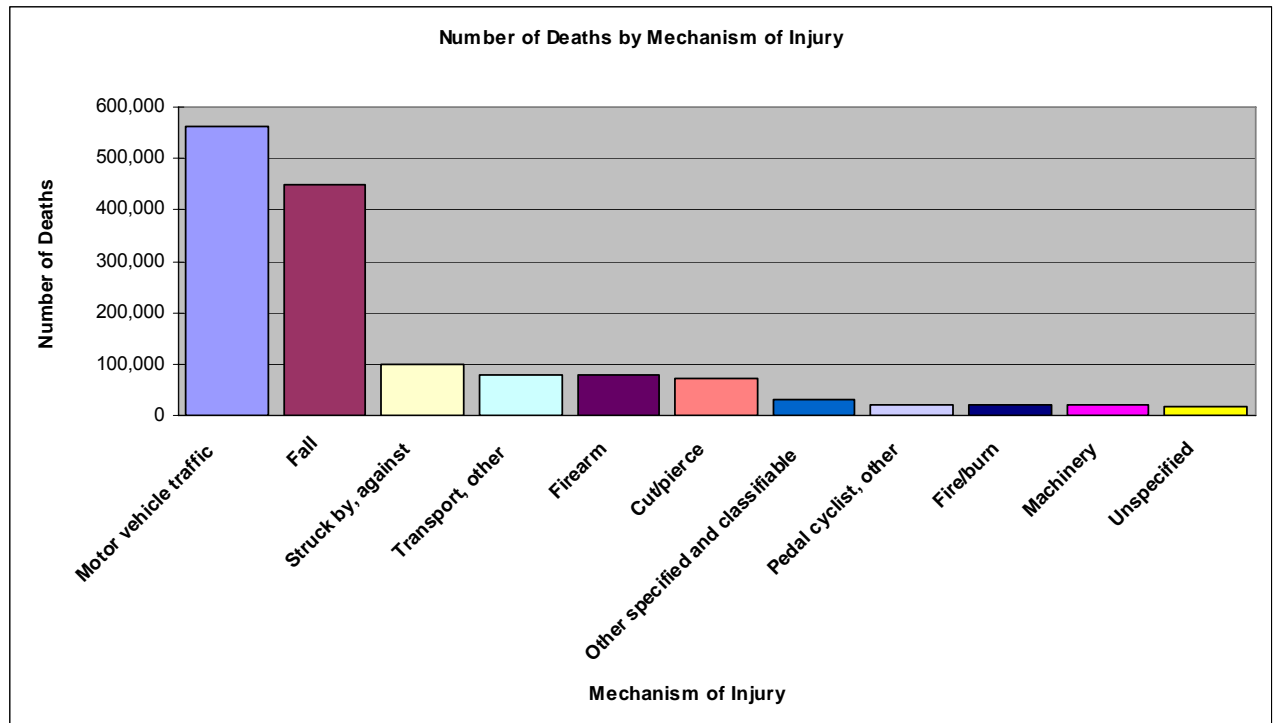


Table 11B Number of deaths and case fatality rate by mechanism of injury (see Appendix D)

Mechanism of Injury	Number	Number Died	Case Fatality Rate
Motor vehicle traffic	562,820	26,798	4.8
Fall	448,258	17,501	3.1
Struck by, against	100,104	1,384	0.2
Transport, other	79,172	1,893	0.3
Firearm	78,447	12,229	2.2
Cut/pierce	72,930	1,359	0.2
Other specified and classifiable	30,048	1,196	0.2
Pedal cyclist, other	22,103	220	0.0
Fire/burn	21,629	1,030	0.2
Machinery	19,409	360	0.1
Unspecified	18,247	808	0.1
Natural/environmental	11,678	110	0.0
Fire/Flame	7,222	208	0.0
Pedestrian, other	5,227	282	0.1
Overexertion	4,457	15	0.0
Suffocation	1,484	347	0.1
Drowning/submersion	889	121	0.0
Poisoning	761	23	0.0
Other natural/environmental	162	13	0.0
Hot objects	51	0	0.0
Total	1,485,098	65,897	

Figure 12A Average hospital length of stay by mechanism of injury

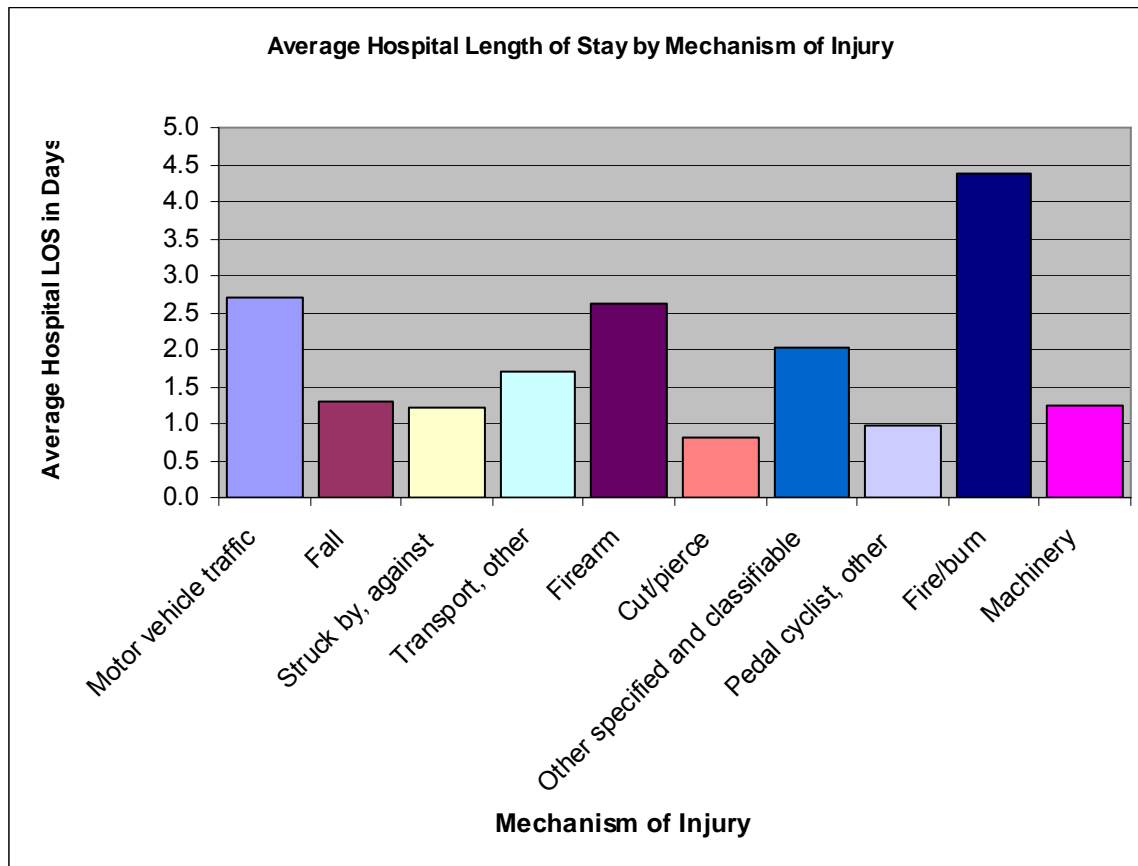


Table 12B Average hospital length of stay by mechanism of injury (see Appendix D)

Mechanism of Injury	Number	Percent	Average LOS Days
Motor vehicle traffic	562,820	37.9	6.2
Fall	448,258	30.2	5.0
Struck by, against	100,104	6.7	3.7
Transport, other	79,172	5.3	4.8
Firearm	78,447	5.3	6.6
Cut/pierce	72,930	4.9	3.3
Other specified and classifiable	30,048	2.0	5.0
Pedal cyclist, other	22,103	1.5	3.2
Fire/burn	21,629	1.5	7.3
Machinery	19,409	1.3	4.9
Unspecified	18,247	1.2	5.2
Natural/environmental	11,678	0.8	3.6
Fire/Flame	7,222	0.5	7.2
Pedestrian, other	5,227	0.4	6.2
Overexertion	4,457	0.3	3.0
Suffocation	1,484	0.1	4.7
Drowning/submersion	889	0.1	5.4
Poisoning	761	0.1	4.8
Other natural/environmental	162	0.0	4.0
Hot objects	51	0.0	7.4
Total	1,485,098	100.0	

Figure 13A Average ICU length of stay by mechanism of injury

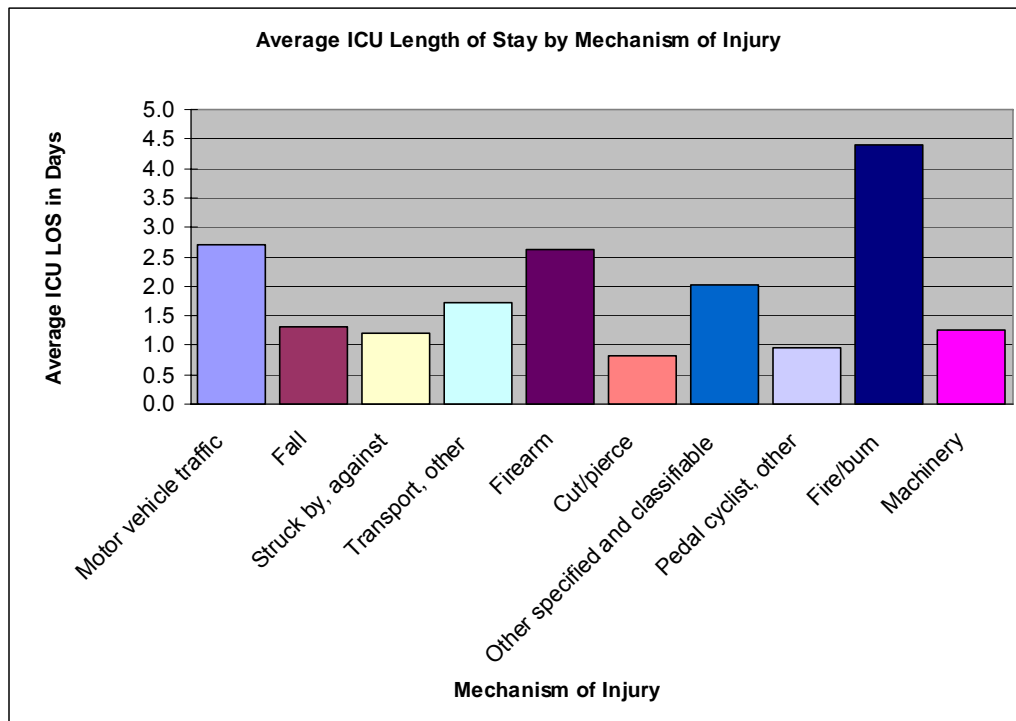


Table 13B Average ICU length of stay by mechanism of injury (see Appendix D)

Mechanism of Injury	Number	Percent	Average ICU LOS Days
Motor vehicle traffic	411,930	39.5	2.7
Fall	294,737	28.3	1.3
Struck by, against	69,503	6.7	1.2
Transport, other	56,949	5.5	1.7
Firearm	58,411	5.6	2.6
Cut/pierce	48,631	4.7	0.8
Other specified and classifiable	21,511	2.1	2.0
Pedal cyclist, other	14,771	1.4	1.0
Fire/burn	16,944	1.6	4.4
Machinery	13,432	1.3	1.2
Unspecified	12,771	1.2	2.1
Natural/environmental	7,960	0.8	0.9
Fire/Flame	5,866	0.6	4.2
Pedestrian, other	3,537	0.3	2.3
Overexertion	2,444	0.2	0.2
Suffocation	1,171	0.1	2.6
Drowning/submersion	690	0.1	3.0
Poisoning	551	0.1	1.9
Other natural/environmental	127	0.0	2.6
Hot objects	33	0.0	3.9
Total	1,041,969	100.00	

Note: A total of 443,129 incidents were missing ICU days.

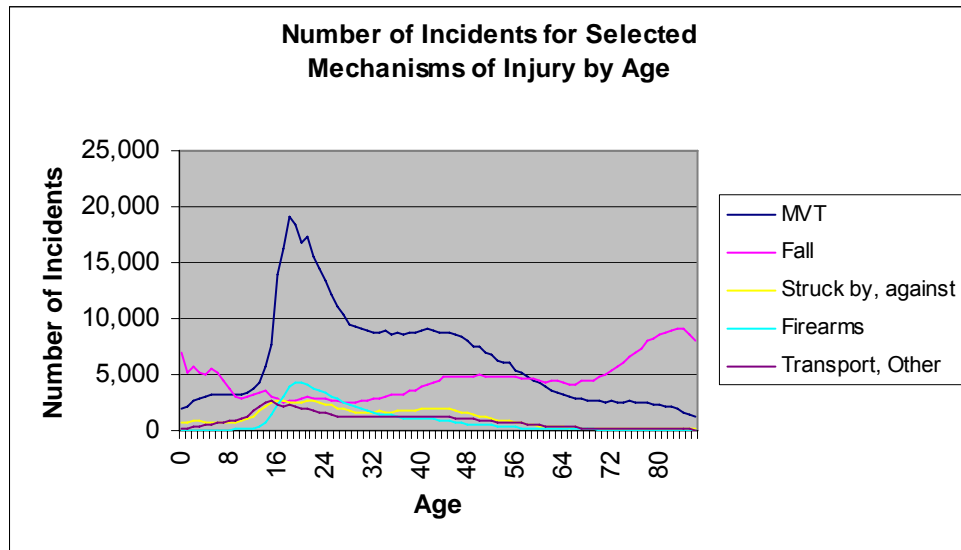


Figure 14A Number of incidents for selected mechanisms of injury, by age

Table 14B Number and percentage of incidents for selected mechanisms of injury by age

Age Range	Number	Number by Motor Vehicle Traffic	Motor Vehicle Traffic Percent	Number Fall	Fall Percent	Number Struck by, against	Struck by, against Percent	Number Transport, Other	Transport, other Percent	Number Firearms	Firearms Percent
<1	15,229	1,939	0.3	7,044	1.6	729	0.7	117	0.1	71	0.1
1-4	49,301	10,688	1.9	20,959	4.7	3,337	3.3	1,303	1.6	252	0.3
5-9	56,207	16,016	2.8	22,011	4.9	3,741	3.7	3,718	4.7	372	0.5
10-14	66,112	20,242	3.6	15,969	3.6	7,168	7.2	8,690	11.0	1,652	2.1
15-19	147,246	75,452	13.4	13,710	3.1	12,826	12.8	11,660	14.7	14,975	19.1
20-24	156,621	77,574	13.8	14,425	3.2	12,678	12.7	9,014	11.4	18,992	24.2
25-34	213,071	96,714	17.2	26,815	6.0	18,006	18.0	12,669	16.0	21,098	26.9
35-44	206,654	87,919	15.6	38,412	8.6	18,463	18.4	12,681	16.0	11,209	14.3
45-54	180,958	74,705	13.3	48,229	10.8	13,695	13.7	9,557	12.1	5,774	7.4
55-64	116,510	44,283	7.9	45,715	10.2	5,077	5.1	5,207	6.6	2,184	2.8
65-74	88,209	26,898	4.8	48,630	10.8	2,122	2.1	2,386	3.0	914	1.2
75-84	112,527	22,684	4.0	81,614	18.2	1,417	1.4	1,530	1.9	610	0.8
≥85	76,453	7,706	1.4	64,725	14.4	845	0.8	640	0.8	344	0.4
Total	1,485,098	562,820	100.0	448,258	100.0	100,104	100.0	79,172	100.0	78,447	100.0

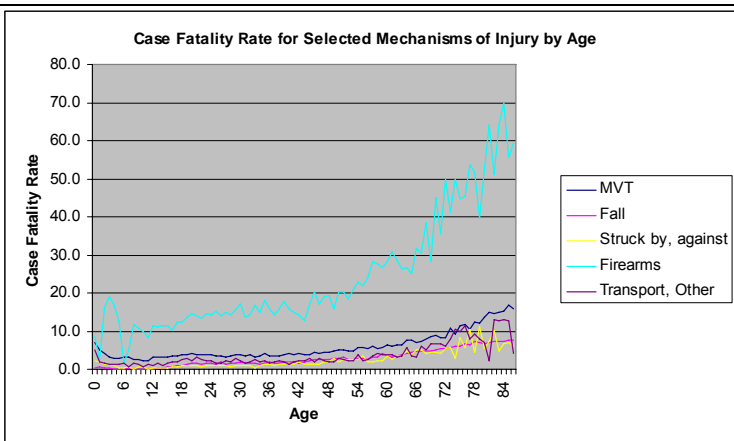


Figure 15A Case fatality rate for selected mechanism of injury, by age

Table 15B Number died and case fatality rate for selected mechanisms of injury, by age

Age Range	Number Died	Number Died Motor Vehicle Traffic	Motor Vehicle Traffic Case Fatality Rate	Number Died Fall	Fall Case Fatality Rate	Number Died Struck by, against	Stuck by, Against Case Fatality Rate	Number Died Transport, Other	Transport, other Case Fatality Rate	Number Died Firearms	Firearms Case Fatality Rate
<1	451	134	6.9	26	0.4	16	2.2	6	5.1	6	8.5
1-4	908	403	3.8	64	0.3	46	1.4	17	1.3	38	15.1
5-9	682	460	2.9	27	0.1	17	0.5	48	1.3	32	8.6
10-14	1,038	587	2.9	30	0.2	21	0.3	91	1.0	183	11.1
15-19	5,339	2,723	3.6	115	0.8	94	0.7	240	2.1	1,844	12.3
20-24	6,685	2,997	3.9	212	1.5	110	0.9	220	2.4	2,684	14.1
25-34	8,122	3,381	3.5	421	1.6	164	0.9	256	2.0	3,159	15.0
35-44	7,346	3,372	3.8	707	1.8	244	1.3	263	2.1	1,772	15.8
45-54	7,451	3,536	4.7	1,322	2.7	273	2.0	231	2.4	1,111	19.2
55-64	5,717	2,686	6.1	1,554	3.4	147	2.9	181	3.5	580	26.6
65-74	5,738	2,230	8.3	2,496	5.1	97	4.6	142	6.0	329	36.0
75-84	9,649	2,939	13.0	5,655	6.9	108	7.6	143	9.3	315	51.6
≥85	6,771	1,350	17.5	4,872	7.5	47	5.6	55	8.6	176	51.2
Total	65,897	26,798		17,501		1,384		1,893		12,229	

Figure 16A Percentage of incidents by injury severity score (ISS)

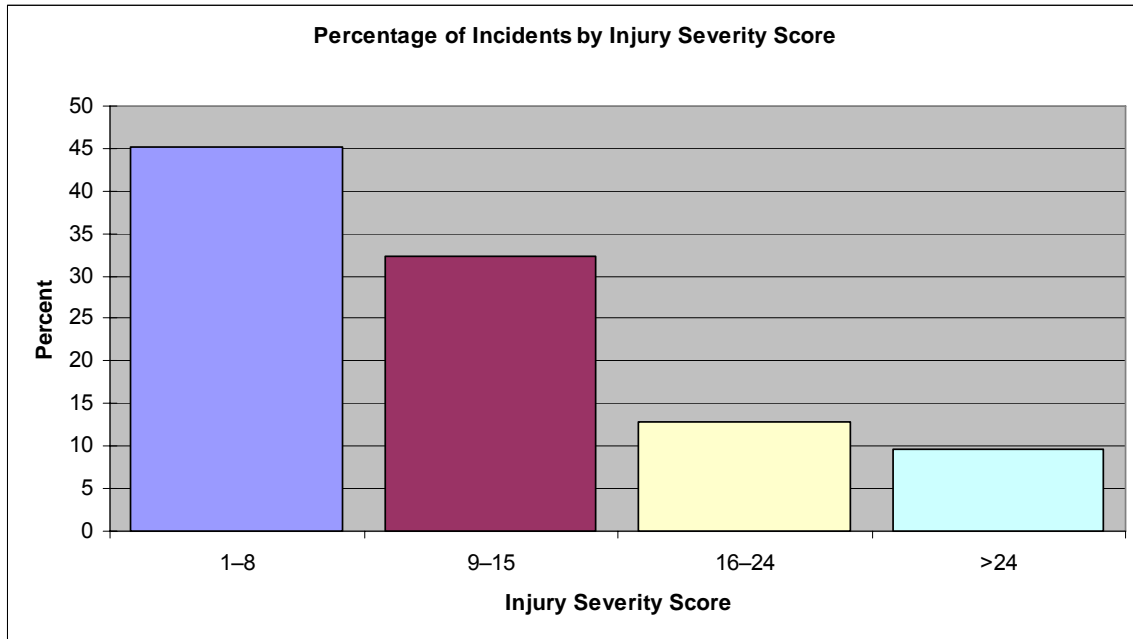


Table 16B Number and percentage of incidents by injury severity score (ISS)

ISS Range	Number	Percent
1-8	671,798	45.2
9-15	480,520	32.4
16-24	190,647	12.8
>24	142,133	9.6
Total	1,485,098	100.0

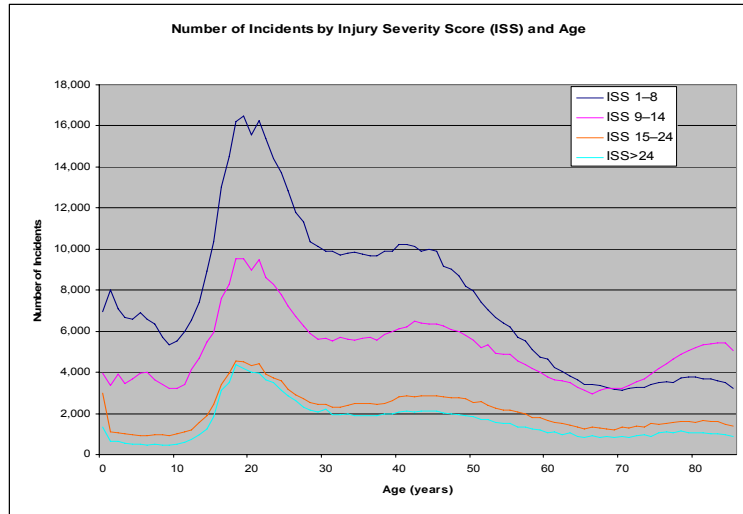


Figure 17A Number of incidents by injury severity score (ISS) range, at each age

Table 17B Percentage of patients by injury severity score (ISS) and age

Age Range	Number Incidents ISS 1-8	Number Died ISS 1-8	Case Fatality Rate ISS 1-8	Number Incidents ISS 9-15	Number Died ISS 9-15	Case Fatality Rate ISS 9-15	Number Incidents ISS 16-24	Number Died ISS 16-24	Case Fatality Rate ISS 16-24	Number Incidents ISS>24	Number Died ISS>24	Case Fatality Rate ISS>24
<1	6,958	27	0.4	3,963	20	0.5	2,990	80	2.7	1,318	324	24.6
1-4	28,405	58	0.2	14,409	62	0.4	4,159	99	2.4	2,328	689	29.6
5-9	30,898	49	0.2	18,207	37	0.2	4,690	60	1.3	2,412	536	22.2
10-14	34,360	65	0.2	20,958	66	0.3	6,759	101	1.5	4,035	806	20.0
15-19	70,505	287	0.4	40,824	373	0.9	18,824	601	3.2	17,093	4,078	23.9
20-24	75,333	407	0.5	43,135	507	1.2	19,940	787	3.9	18,213	4,984	27.4
25-34	105,589	561	0.5	59,855	684	1.1	25,652	992	3.9	21,975	5,885	26.8
35-44	99,383	531	0.5	60,371	655	1.1	26,763	989	3.7	20,137	5,171	25.7
45-54	80,472	508	0.6	56,392	746	1.3	25,816	1,110	4.3	18,278	5,087	27.8
55-64	47,695	412	0.9	39,763	758	1.9	17,319	968	5.6	11,733	3,579	30.5
65-74	32,911	479	1.5	33,335	1,038	3.1	13,181	1,048	8.0	8,782	3,173	36.1
75-84	36,291	761	2.1	50,043	2,175	4.3	15,686	1,966	12.5	10,507	4,747	45.2
≥85	22,998	686	3.0	39,265	2,179	5.5	8,868	1,342	15.1	5,322	2,564	48.2
Total	671,798	4,831		480,520	9,300		190,647	10,143		142,133	41,623	

Figure 18A Case fatality rate by injury severity score (ISS)

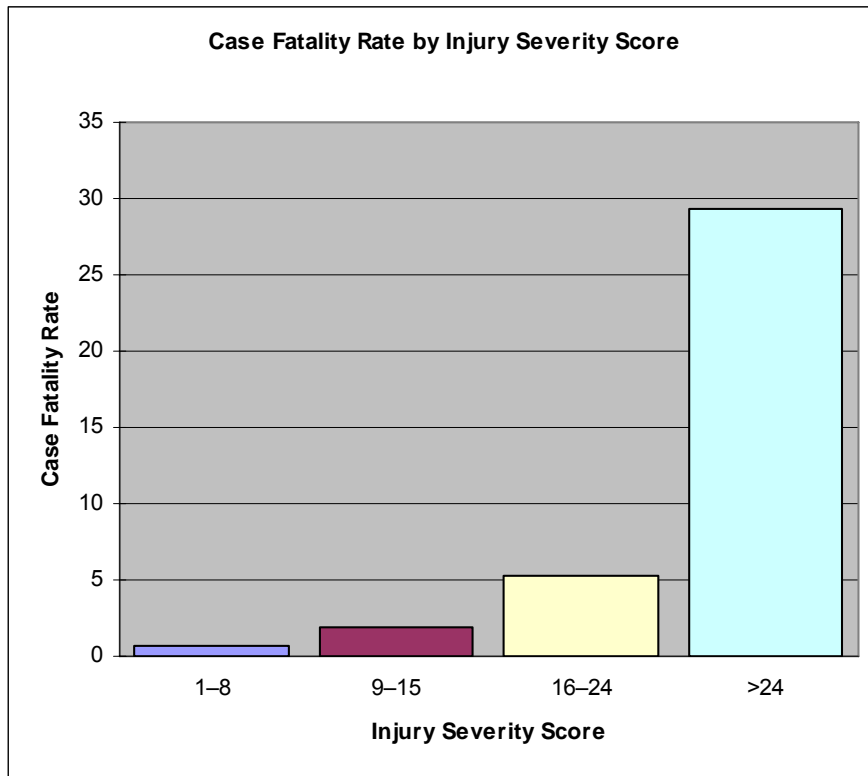


Table 18B Case fatality rate by injury severity score (ISS)

ISS Range	Number	Number Died	Case Fatality Rate
1-8	671,798	4,831	0.7
9-15	480,520	9,300	1.9
16-24	190,647	10,143	5.3
>24	142,133	41,623	29.3
Total	1,485,098	65,897	

Table 19A Average hospital length of stay by injury severity score (ISS)

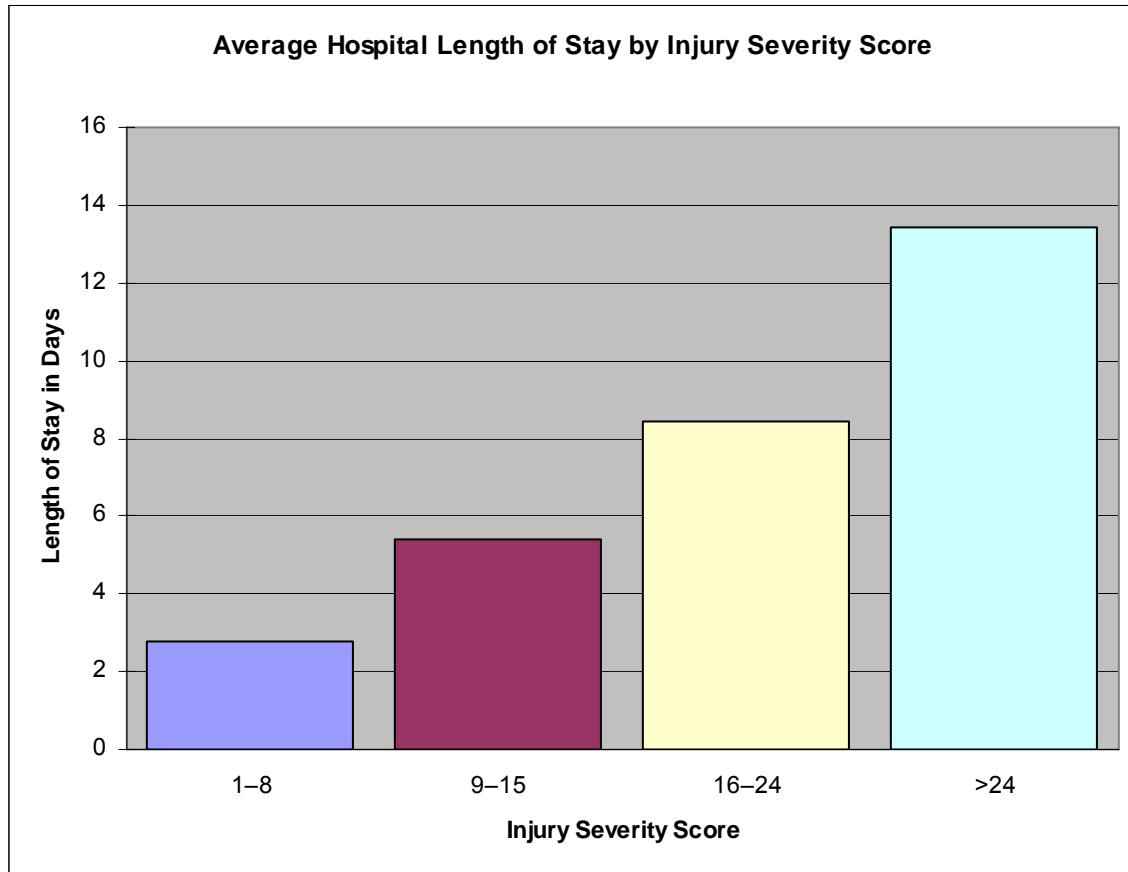


Table 19B Average hospital length of stay by injury severity score (ISS)

ISS Range	Number	Percent	Average LOS (Days)
1-8	671,798	45.2	2.8
9-15	480,520	32.4	5.4
16-24	190,647	12.8	8.4
>24	142,133	9.6	13.4
Total	1,485,098	100.0	

Figure 20A Average ICU length of stay by injury severity score (ISS)

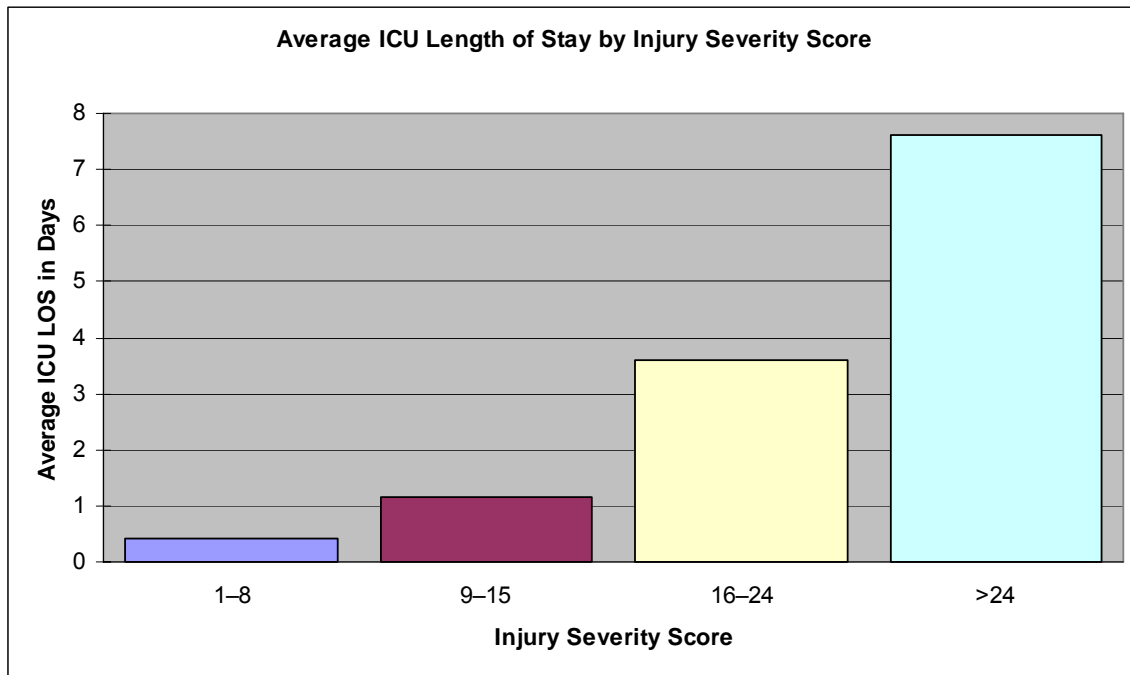


Table 20B Average ICU length of stay by injury severity score (ISS)

ISS Range	Number	Percent	Average ICU Days
1-8	430,189	41.1	0.4
9-15	330,316	31.5	1.2
16-24	159,295	15.2	3.6
>24	127,277	12.2	7.6
Total	1,047,077	100.0	

Note: A total of 443,129 incidents were missing ICU days.

Figure 21A Number of incidents by intent

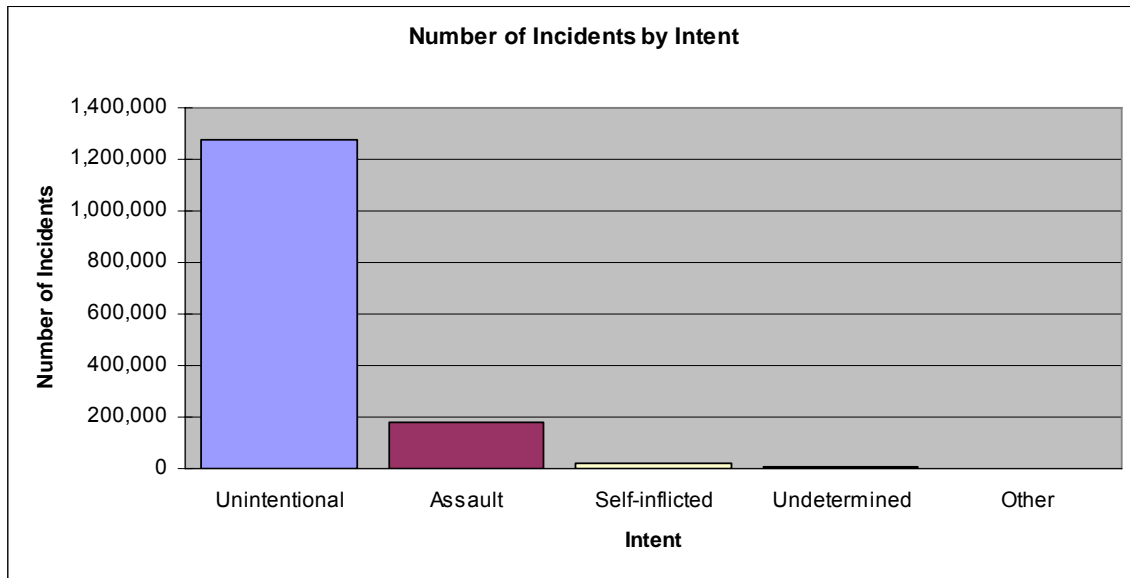


Table 21B Number and percentage of incidents by intent (see Appendix D)

Intent	Number	Percent
Unintentional	1,276,288	85.9
Assault	177,700	12.0
Self-inflicted	21,441	1.4
Undetermined	7,593	0.5
Other	2,076	0.1
Total	1,485,098	100.0

Figure 22A Case fatality rate by intent

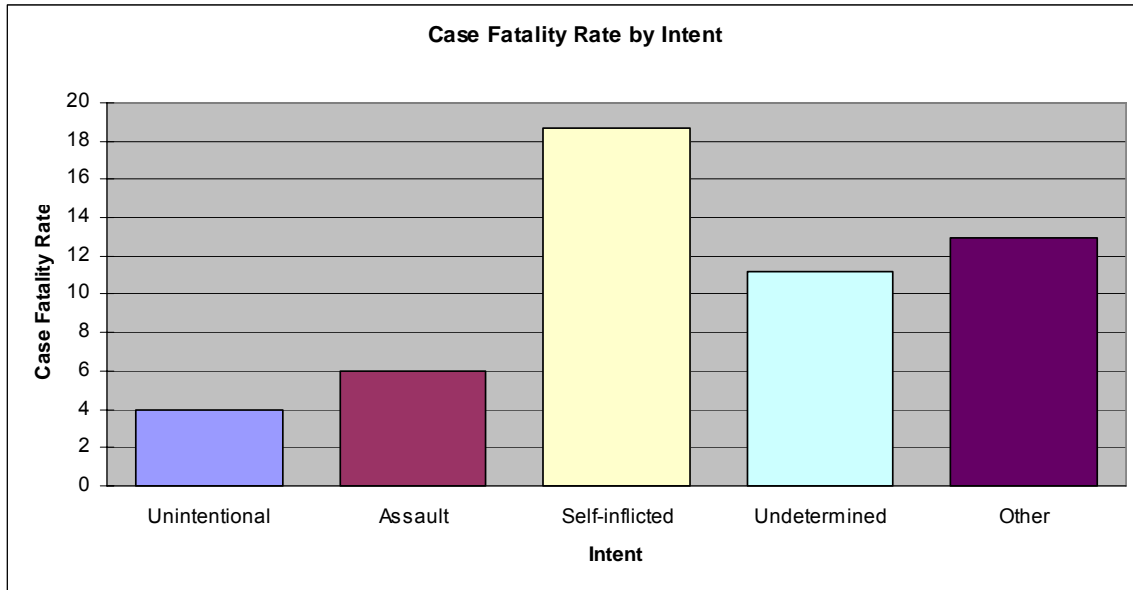


Table 22B Case fatality rate by intent (see Appendix D)

Intent	Number	Number Died	Case Fatality Rate
Unintentional	1,276,288	50,065	3.9
Assault	177,700	10,710	6.0
Self-inflicted	21,441	4,006	18.7
Undetermined	7,593	848	11.2
Other	2,076	268	12.9
Total	1,485,098	65,897	

Figure 23A Percentage of incidents by type of injury

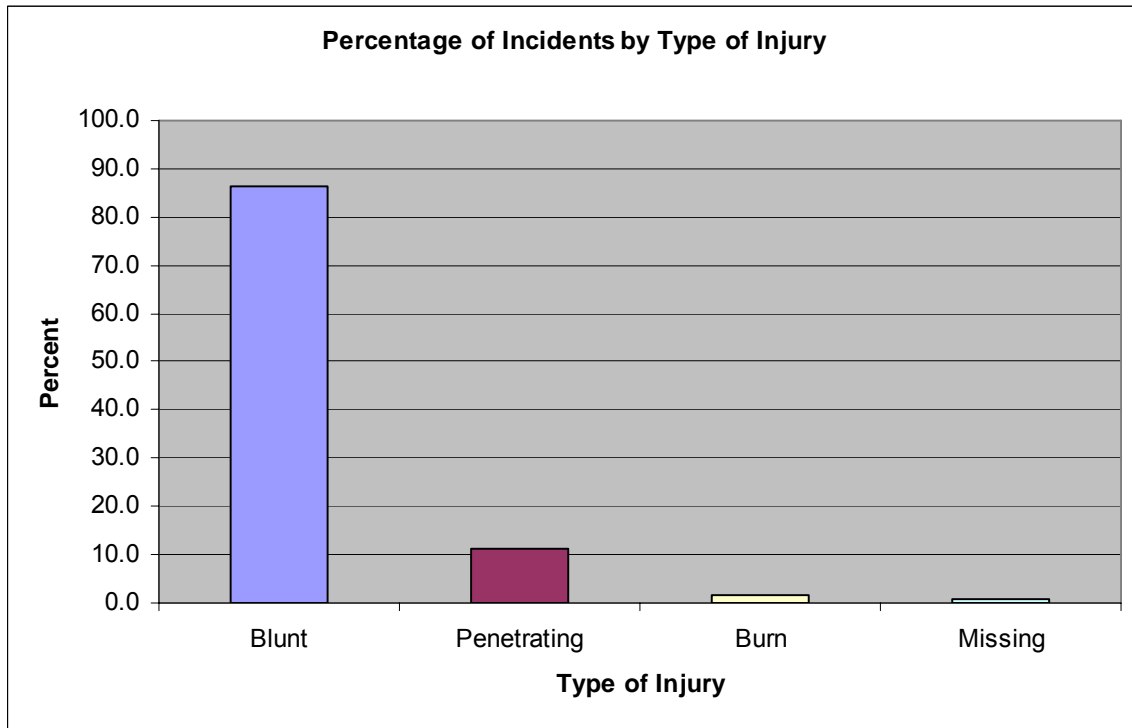


Table 23B Number and percentage of incidents by type of injury

Injury Type	Number	Percent
Blunt	1,280,787	86.2
Penetrating	165,427	11.1
Burn	24,702	1.7
Missing	14,182	1.0
Total	1,485,098	100.0

Figure 24A Case fatality rate by type of injury

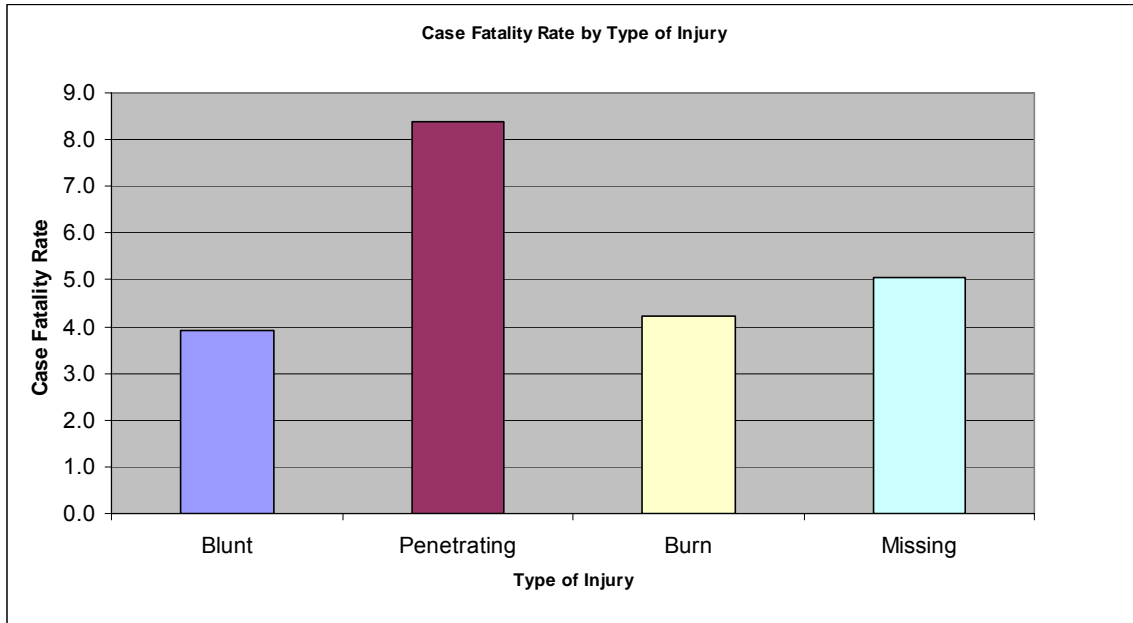


Table 24B Case fatality rate by type of injury

Injury Type	Number	Number Died	Case Fatality Rate
Blunt	1,280,787	50,284	3.9
Penetrating	165,427	13,850	8.4
Burn	24,702	1,046	4.2
Missing	14,182	717	5.1
Total	1,485,098	65,897	

Figure 25A Percentage of incidents by organ system

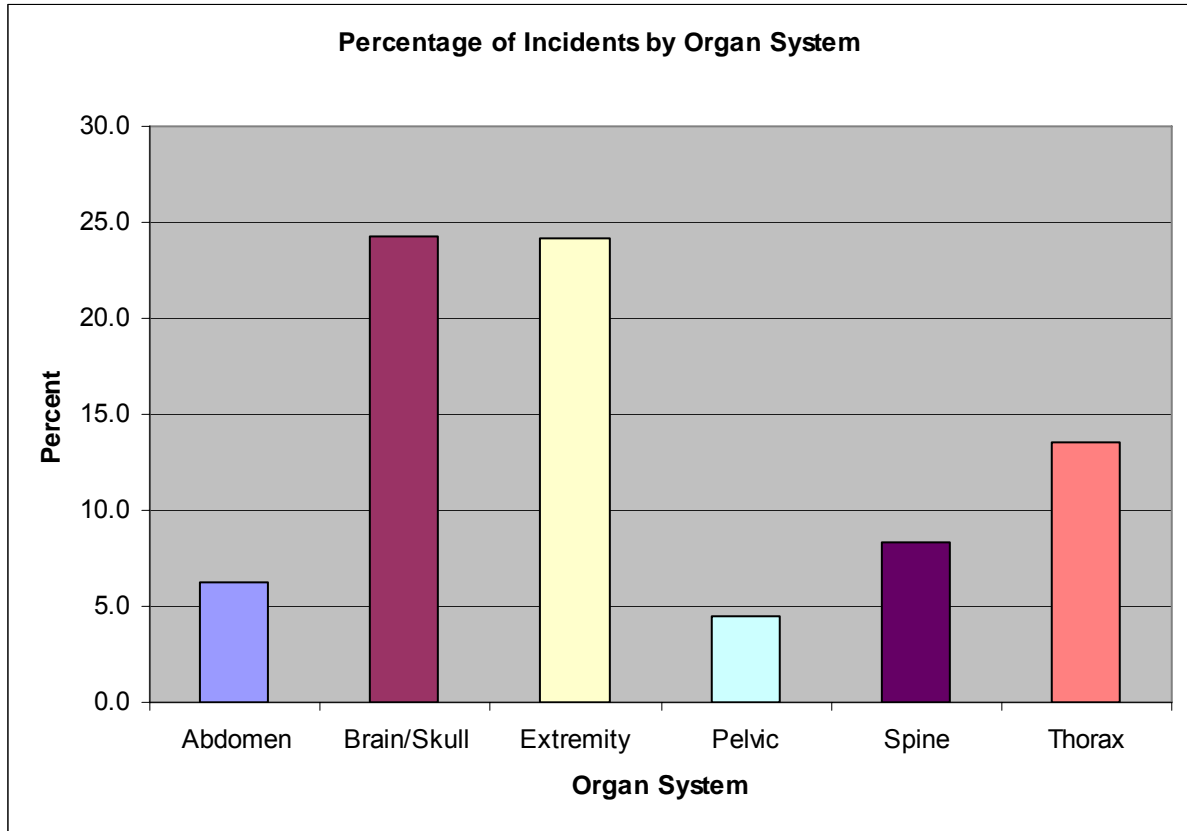


Table 25B Number and percentage of incidents by organ system

Organ System	Number	Percent
Abdomen	93,544	6.3
Brain/skull	359,955	24.2
Extremity	359,572	24.2
Pelvic	67,123	4.5
Spine	124,163	8.4
Thorax	200,951	13.5
Other/unknown	668,471	45.0
Total Incidents	1,485,098	100.0

Note: An incident may involve multiple organ systems and a patient will then be counted in each of the organ systems in which there is an injury. The percentage is calculated as the number of incidents in each organ system divided by the total number of incidents (1,485,098).

The following diagnosis codes were used for each organ system: Abdomen: 863–863.9, 864–864.1, 865–865.1, 866–867.9, and 868. Brain/Skull: 800–804.9 and 850–854.1. Extremity: 812–839.9. Pelvic: 808–808.9. Spine: 805–806.9. Thorax: 807–807.6, 810–811.1, and 860–862.9.

Figure 26A Case fatality rate by organ system

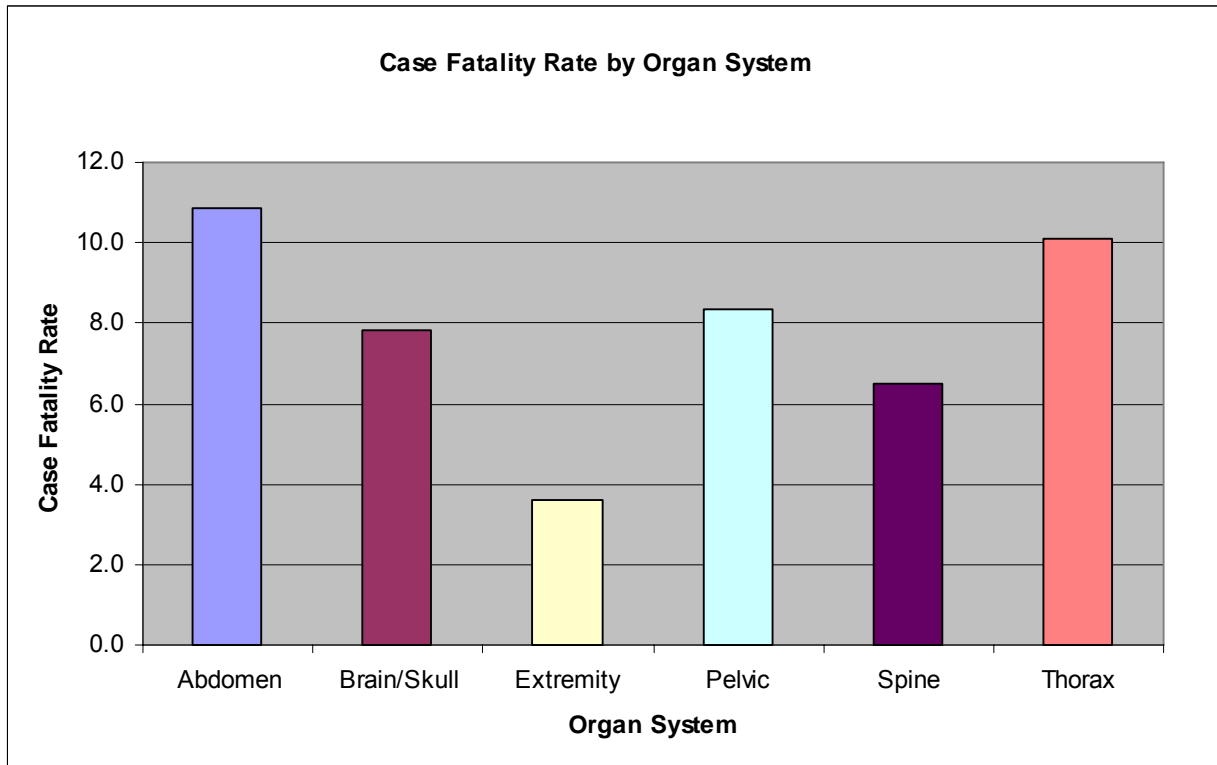


Table 26B Case fatality rate by organ system

Organ System	Number	Number Died	Case Fatality Rate
Abdomen	93,544	10,164	10.9
Brain/skull	359,955	28,154	7.8
Extremity	359,572	12,970	3.6
Pelvic	67,123	5,615	8.4
Spine	124,163	8,094	6.5
Thorax	200,951	20,265	10.1
Other/unknown	668,471	22,239	3.3
Total Incidents	1,485,098	65,897	

Note: An incident may involve multiple organ systems and a patient will then be counted in each of the organ systems in which there is an injury. The case fatality rate is calculated as the number of deaths in each organ system divided by the number of incidents in each organ system. No inferences should be drawn from these data with respect to causality, since the NTDB contains no specific information on proximate cause of death, but only those injuries associated with death.

The following diagnosis codes were used for each organ system: Abdomen: 863–863.9, 864–864.1, 865–865.1, 866–867.9, and 868. Brain/Skull: 800–804.9 and 850–854.1. Extremity: 812–839.9. Pelvic: 808–808.9. Spine: 805–806.9. Thorax: 807–807.6, 810–811.1, and 860–862.9.

Figure 27A Percentage of incidents with brain/skull injuries

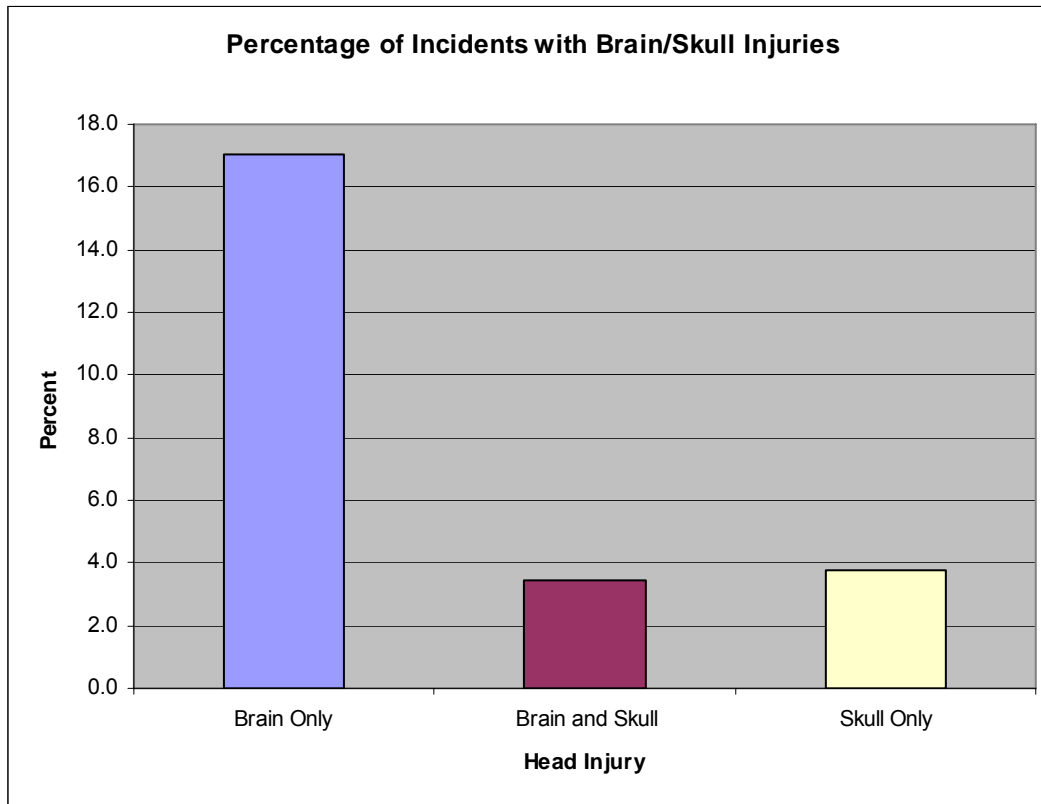


Table 27B Number and percentage of incidents with brain/skull injuries

Head Injury	Number	Percent
Brain only	253,369	17.1
Brain and skull	50,949	3.4
Skull only	55,637	3.7
Total Head Injuries	359,955	24.2
Total Incidents	1,485,098	

Note: An incident may involve multiple head injuries and a patient will then be counted in each of the head injury categories in which there is an injury. The percentage is calculated as the number of incidents in each head injury category divided by the total number of incidents (1,485,098).

The following diagnosis codes were used for Brain and Skull Injuries. Brain Injuries: 850–854.19, 803.1–803.49, 800.1–800.49, 800.6–800.99, 801.1–801.49, 801.6–801.99, 803.6–803.99, 804.1–804.49, and 804.6–804.99. Skull Injuries: 800.0–800.09, 800.5–800.59, 801.0–801.09, 801.5–801.59, 802–803.09, 803.5–803.59, 804–804.09, and 804.5–804.59.

Figure 28A Case fatality rate for brain/skull injuries

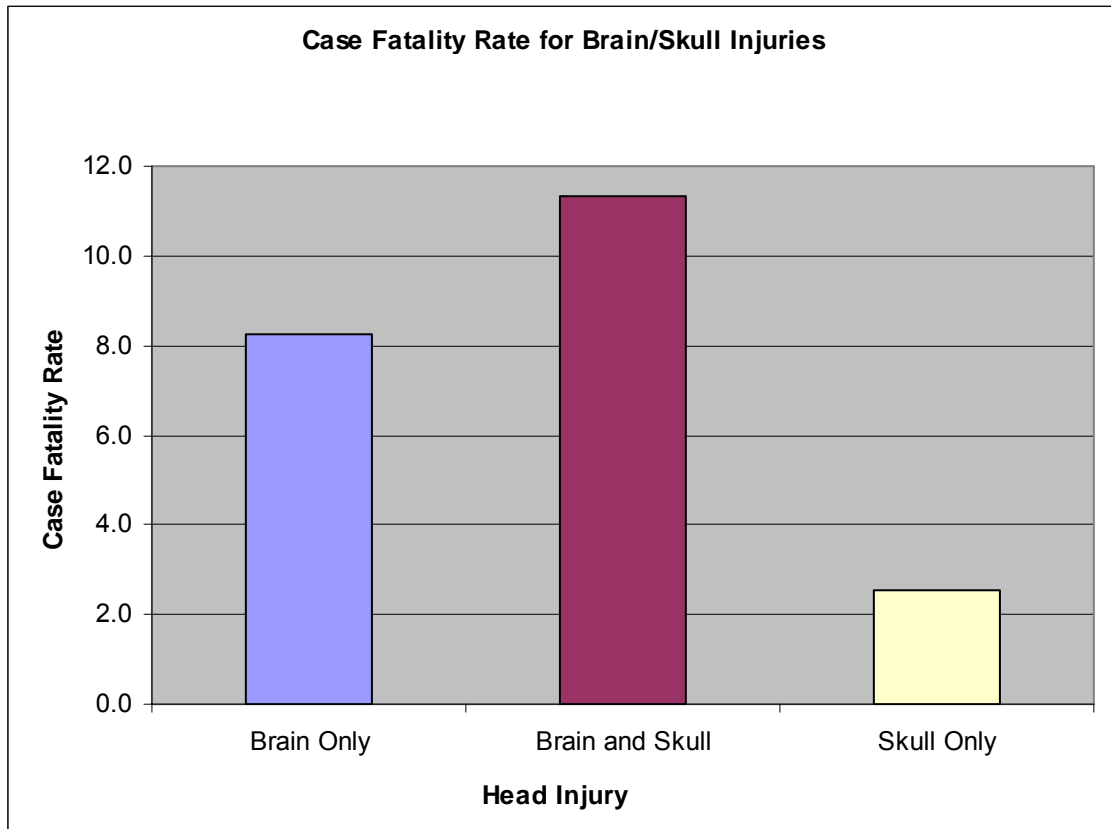


Table 28B Case fatality rate for brain/skull injuries

Head Injury	Number	Number Died	Case Fatality Rate
Brain only	253,369	20,965	8.3
Brain and skull	50,949	5,769	11.3
Skull only	55,637	1,420	2.6
Total Head Injuries	359,955	28,154	7.8

Note: The case fatality rate is calculated as the number of deaths in each head injury category divided by the number of injuries in each category. No inferences should be drawn from these data with respect to causality, since the NTDB contains no specific information on proximate cause of death, but only those injuries associated with death.

The following diagnosis codes were used for Brain and Skull Injuries. Brain Injuries: 850–854.19, 803.1–803.49, 800.1–800.49, 800.6–800.99, 801.1–801.49, 801.6–801.99, 803.6–803.99, 804.1–804.49, and 804.6–804.99. Skull Injuries: 800.0–800.09, 800.5–800.59, 801.0–801.09, 801.5–801.59, 802–803.09, 803.5–803.59, 804–804.09, and 804.5–804.59.

Figure 29A Percentage of incidents with intracranial injuries

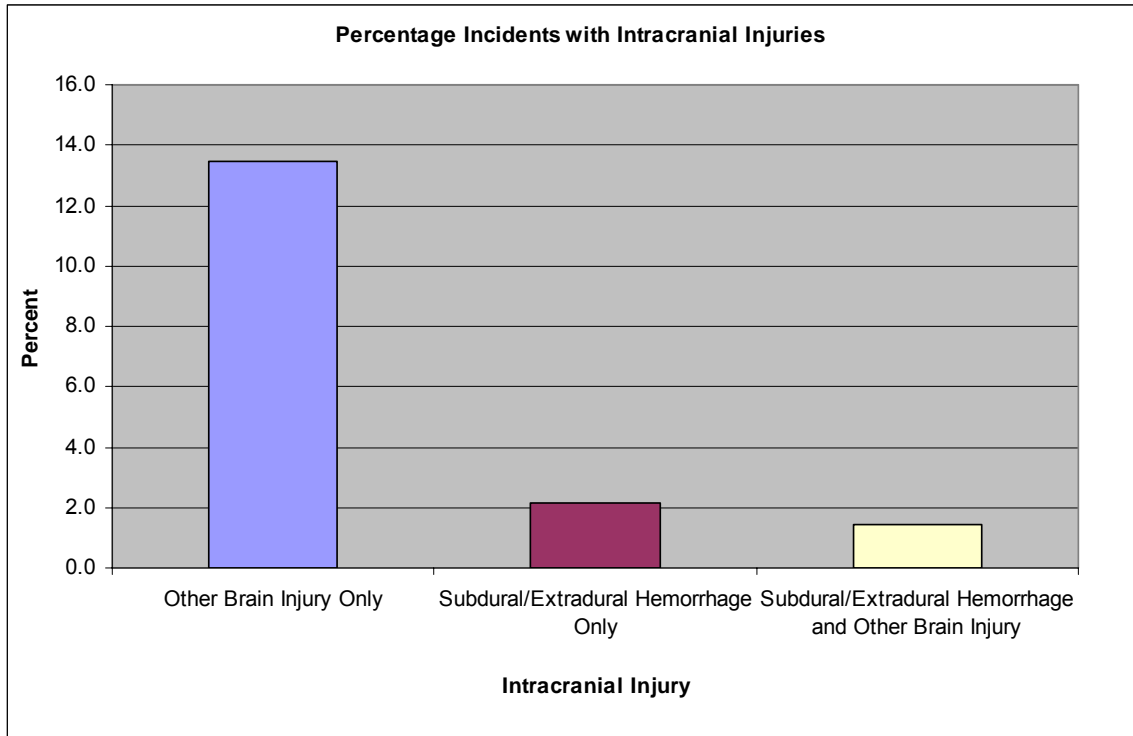


Table 29B Number and percentage of incidents with intracranial injuries

Intracranial Incidents	Number	Percent
Intracranial injury only	199,891	13.5
Subdural/extradural hemorrhage only	32,013	2.2
Subdural/extradural hemorrhage and other brain injury	21,465	1.4
Intracranial Incidents	253,369	17.1
Total Incidents	1,485,098	

Note: The percentage is calculated as the number of incidents in each intracranial injury category divided by the total number of incidents (1,485,098).

The following diagnosis codes were used for Subdural/Extradural Hemorrhage: 852.2–852.59.

Figure 30A Case fatality rate for intracranial injuries

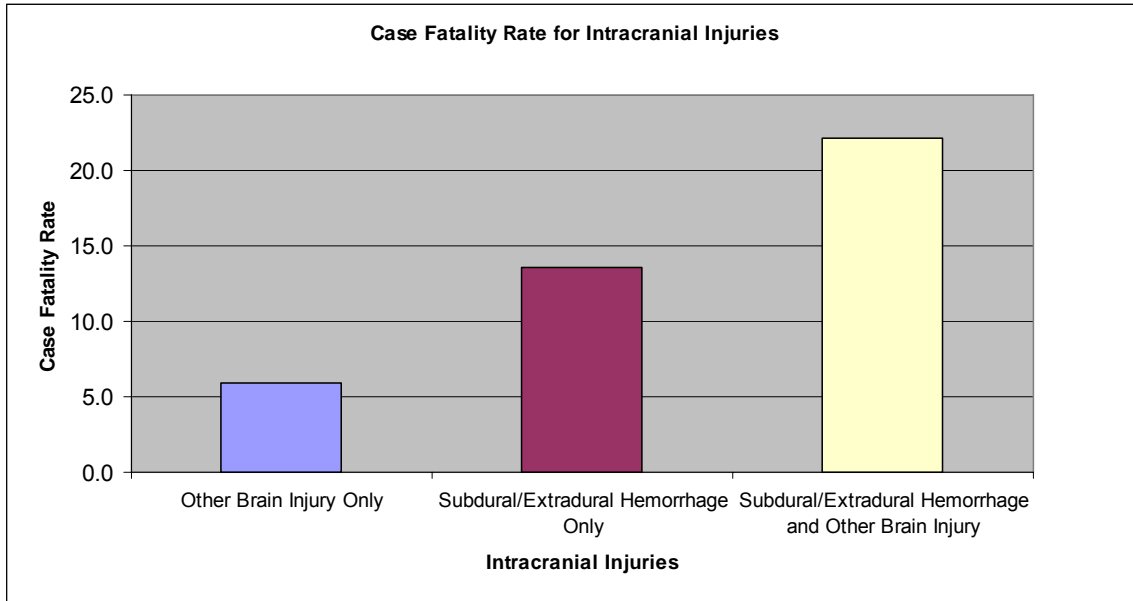


Table 30B Case fatality rate for intracranial injuries

Intracranial Incidents	Number	Number Died	Case Fatality Rate
Intracranial injury only	199,891	11,844	5.9
Subdural/extradural hemorrhage only	32,013	4,360	13.6
Subdural/extradural hemorrhage and other brain injury	21,465	4,761	22.2
Total Intracranial Incidents	253,369	20,965	8.3

Note: The case fatality rate is calculated as the number of deaths in each intracranial injury category divided by the number of incidents each category. No inferences should be drawn from these data with respect to causality, since the NTDB contains no specific information on proximate cause of death, but only those injuries associated with death.

The following diagnosis codes were used for subdural/extradural hemorrhage: 852.2–852.59.

Figure 31A Percentage of incidents with thoracic injuries

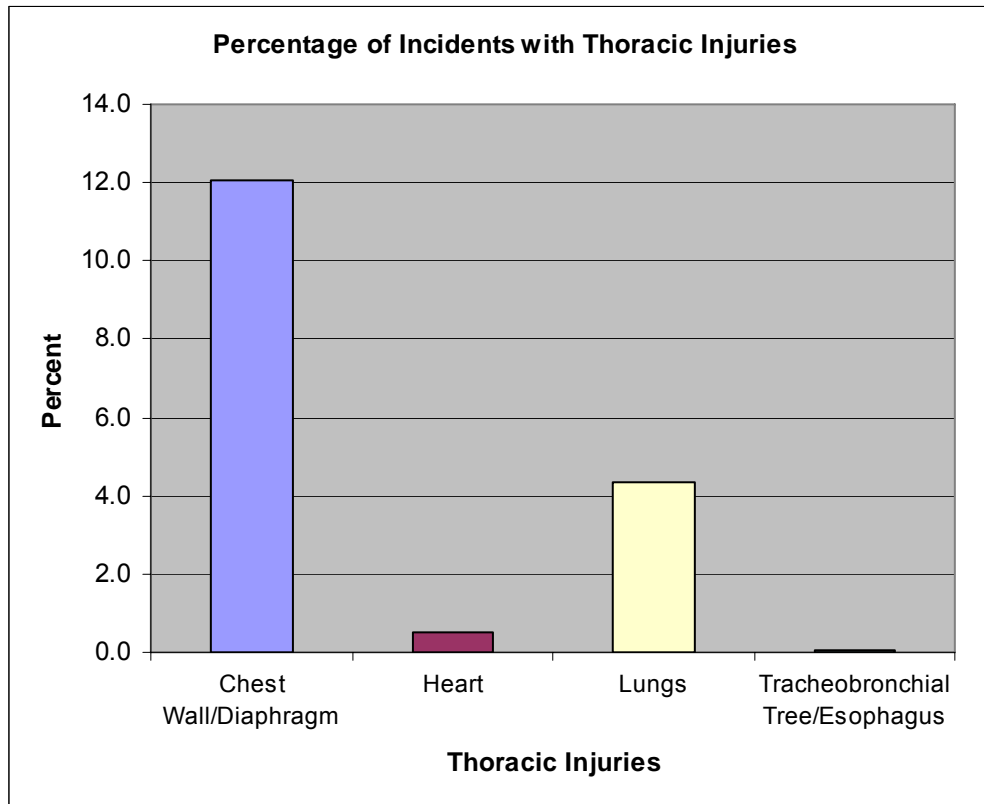


Table 31B Number and percentage of incidents with thoracic injuries

Thoracic Injury	Number	Percent
Chest wall/diaphragm	179,246	12.1
Heart	7,329	0.5
Lungs	64,356	4.3
Tracheobronchial tree/esophagus	683	0.0
Other/unknown	4,435	0.3
Total Incidents	1,485,098	

Note: An incident may involve multiple thoracic injuries and a patient will then be counted in each of the thoracic injury categories in which there is an injury. The percentage is the number of incidents in each thoracic injury category divided by the total number of incidents (1,485,098).

The following diagnosis codes were used for the thoracic categories: Chest wall/diaphragm: 807–807.6, 810–811.29, 860–860.9, and 862–862.19. Heart: 861–861.19. Lungs: 861.2–861.39. Tracheobronchial tree/esophagus: 862.21, 862.22, 862.31, and 862.32.

Figure 32A Case fatality rate for thoracic injuries

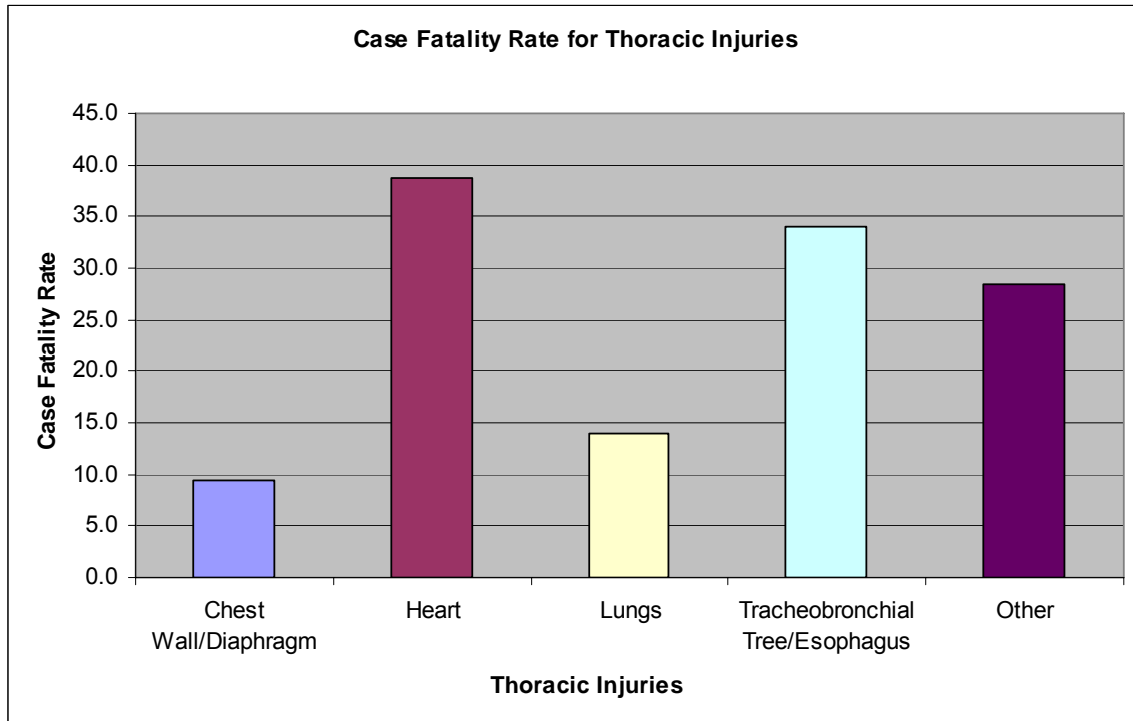


Table 32B Case fatality rate for thoracic injuries

Thoracic Injury	Number	Number Died	Case Fatality Rate
Chest wall/diaphragm	179,246	17,035	9.5
Heart	7,329	2,842	38.8
Lungs	64,356	8,939	13.9
Tracheobronchial tree/esophagus	683	232	34.0
Other/unknown	4,435	1,264	28.5
Total Incidents	1,485,098	65,897	

Note: An incident may involve multiple thoracic injuries and a patient will then be counted in each of the thoracic injury categories in which there is an injury. The case fatality rate is calculated as the number of deaths in each thoracic injury category divided by the number of incidents in each category. No inferences should be drawn from these data with respect to causality, since the NTDB contains no specific information on proximate cause of death, but only those injuries associated with death.

The following diagnosis codes were used for the thoracic categories: Chest Wall/Diaphragm: 807–807.6, 810–811.29, 860–860.9, and 862–862.19. Heart: 861–861.19. Lungs: 861.2–861.39. Tracheobronchial Tree/Esophagus: 862.21, 862.22, 862.31, and 862.32.

Figure 33A Percentage of incidents with abdominal injuries

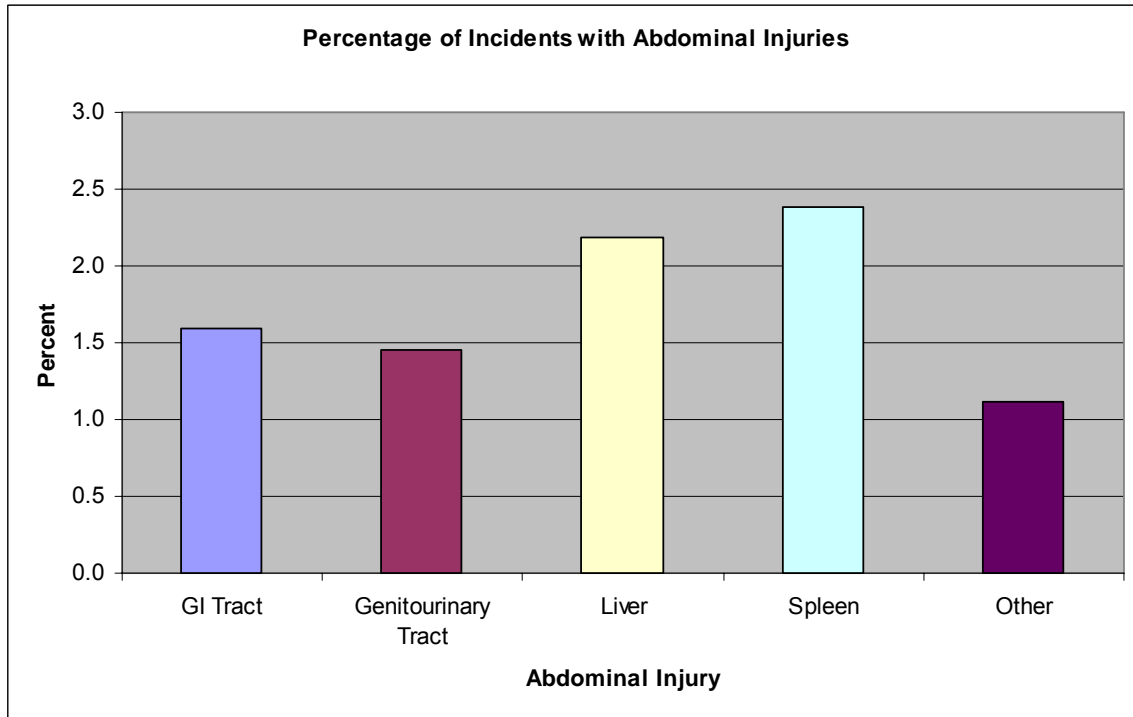


Table 33B Number and percentage of incidents with abdominal injuries

Abdominal Injury	Number	Percent
GI tract	23,614	1.6
Genitourinary tract	21,624	1.5
Liver	32,455	2.2
Spleen	35,414	2.4
Other/unknown	16,494	1.1
Total Incidents	1,485,098	

Note: An incident may involve multiple abdominal injuries and a patient will then be counted in each of the abdominal injury categories in which there is an injury. The percentage is the number of incidents in each abdominal injury category divided by the total number of incidents (1,485,098).

The following diagnosis codes were used for the abdominal categories: GI Tract: 863–863.99. Genitourinary Tract: 866–867.9. Liver: 864–864.19. Spleen: 865–865.19.

Figure 34A Case fatality rate for abdominal injuries

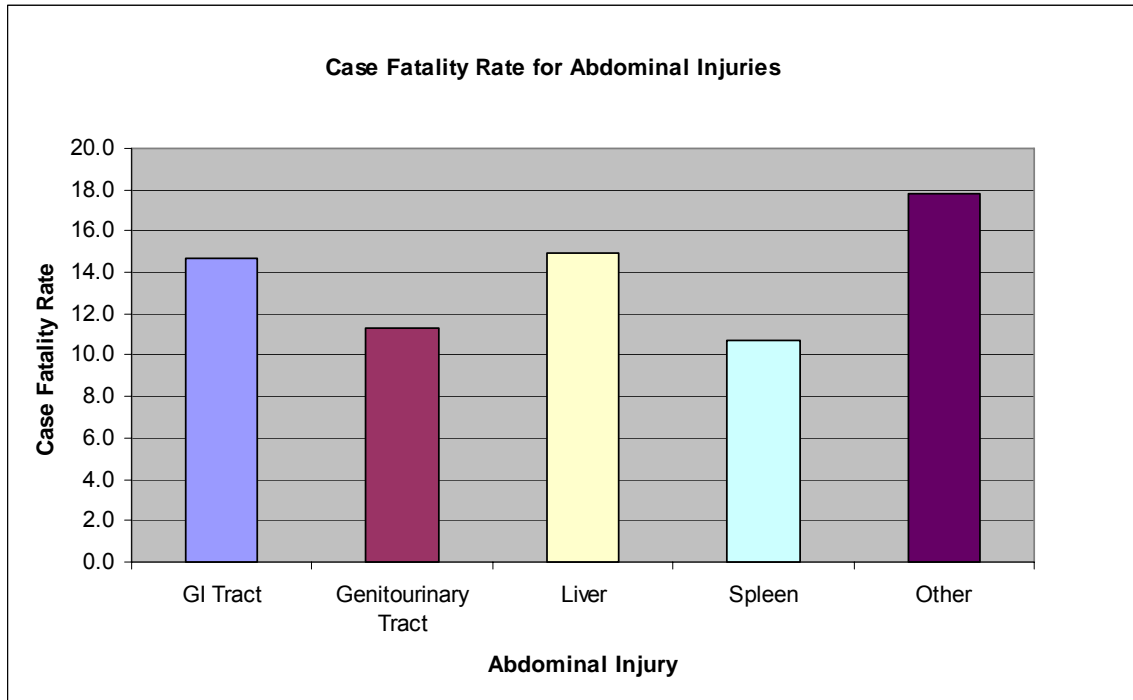


Table 34B Case fatality rate for abdominal injuries

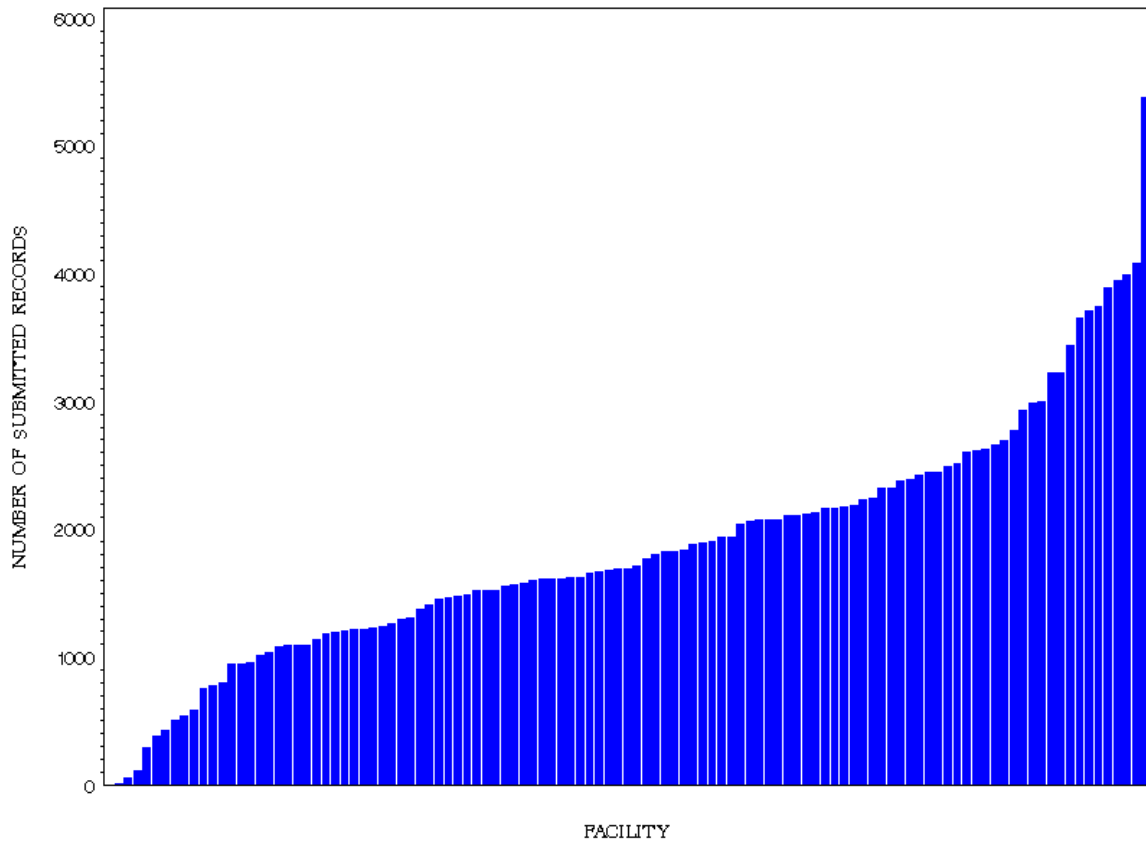
Abdominal Injury	Number	Number Died	Case Fatality Rate
GI tract	23,614	3,458	14.6
Genitourinary tract	21,624	2,440	11.3
Liver	32,455	4,845	14.9
Spleen	35,414	3,796	10.7
Other/unknown	16,494	2,932	17.8
Total Incidents	1,485,098	65,897	

Note: An incident may involve multiple abdominal injuries and a patient will then be counted in each of the abdominal injury categories in which there is an injury. The case fatality rate is calculated as the number of deaths in each abdominal injury category divided by the number of incidents in each category. No inferences should be drawn from these data with respect to causality, since the NTDB contains no specific information on proximate cause of death, but only those injuries associated with death.

The following diagnosis codes were used for the abdominal categories: GI Tract: 863–863.99. Genitourinary Tract: 866–867.9. Liver: 864–864.19. Spleen: 865–865.19.

Figure 35A Number of records submitted per facility for Level I hospitals

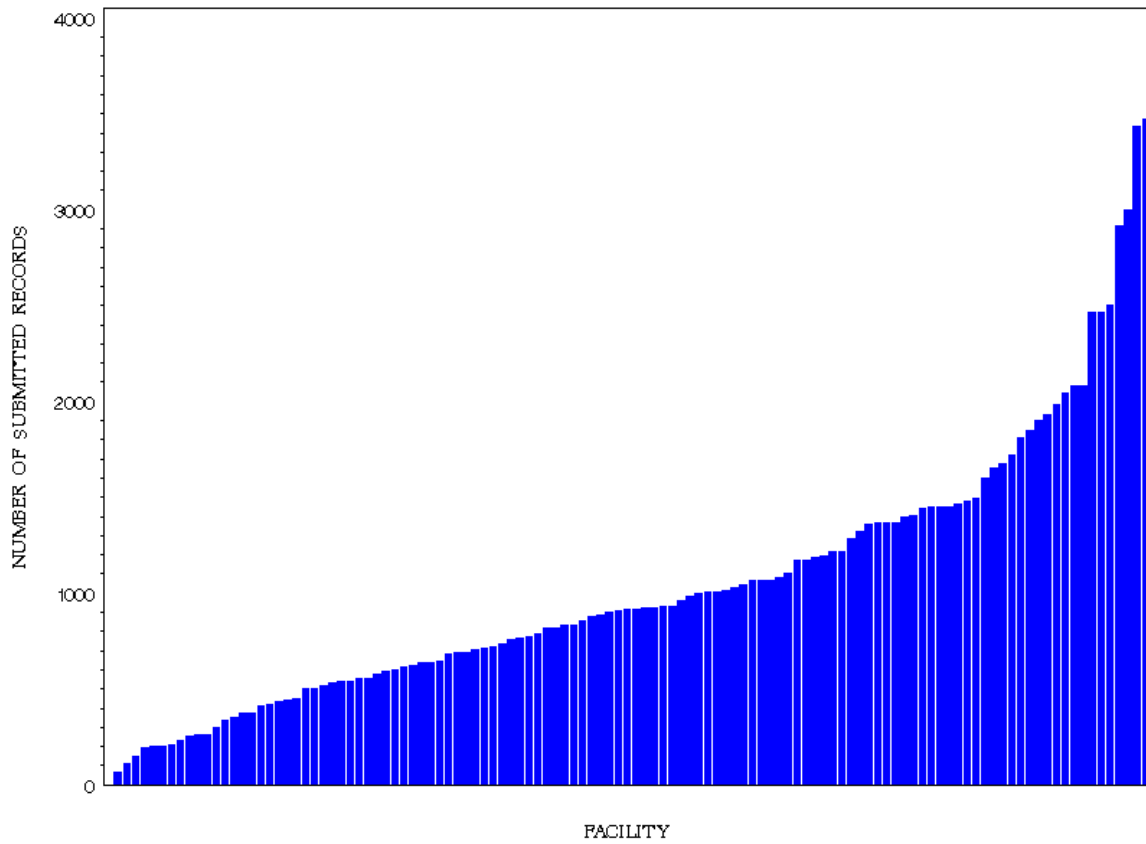
Number of records submitted with a 2006 admission year from Level I hospitals



Note: 111 hospitals with designation level I submitted data.

Figure 35B: Number of records submitted per facility for Level II hospitals

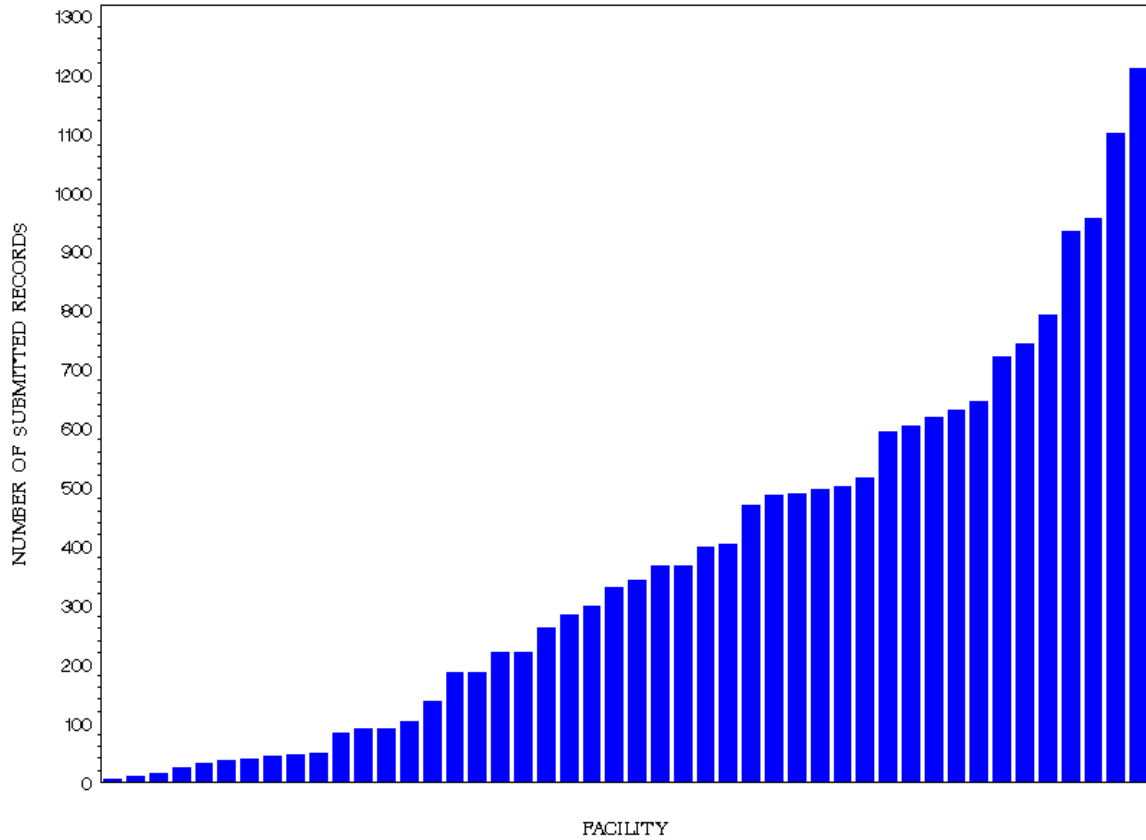
Number of records submitted with a 2006 admission year from Level II hospitals



Note: 117 hospitals with designation level II submitted data.

Figure 35C Number of records submitted per facility for Level III or IV hospitals

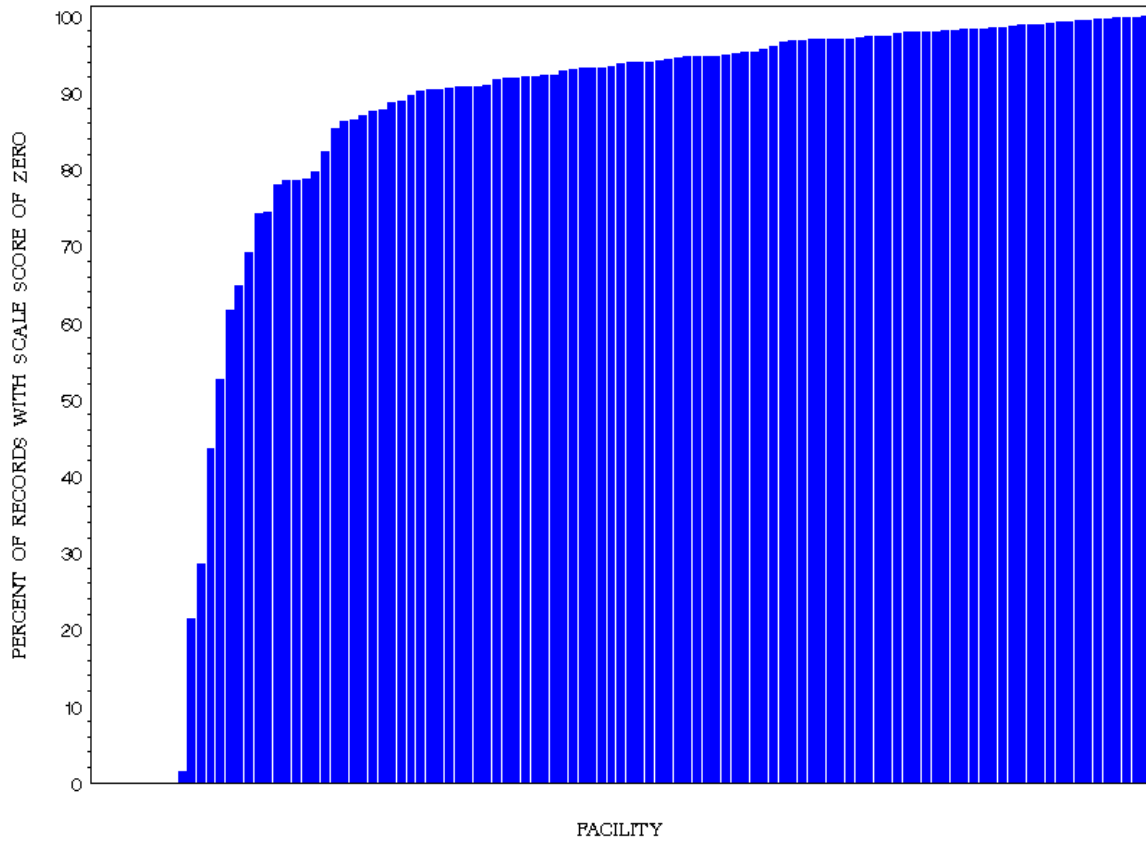
Number of records submitted with a 2006 admission year from Level III or IV hospitals



Note: 46 hospitals with designation level III or IV submitted data.

Figure 36A Data completeness per facility for Level I hospitals

Proportion of records included in the annual report with a 2006 admission year from Level I hospitals

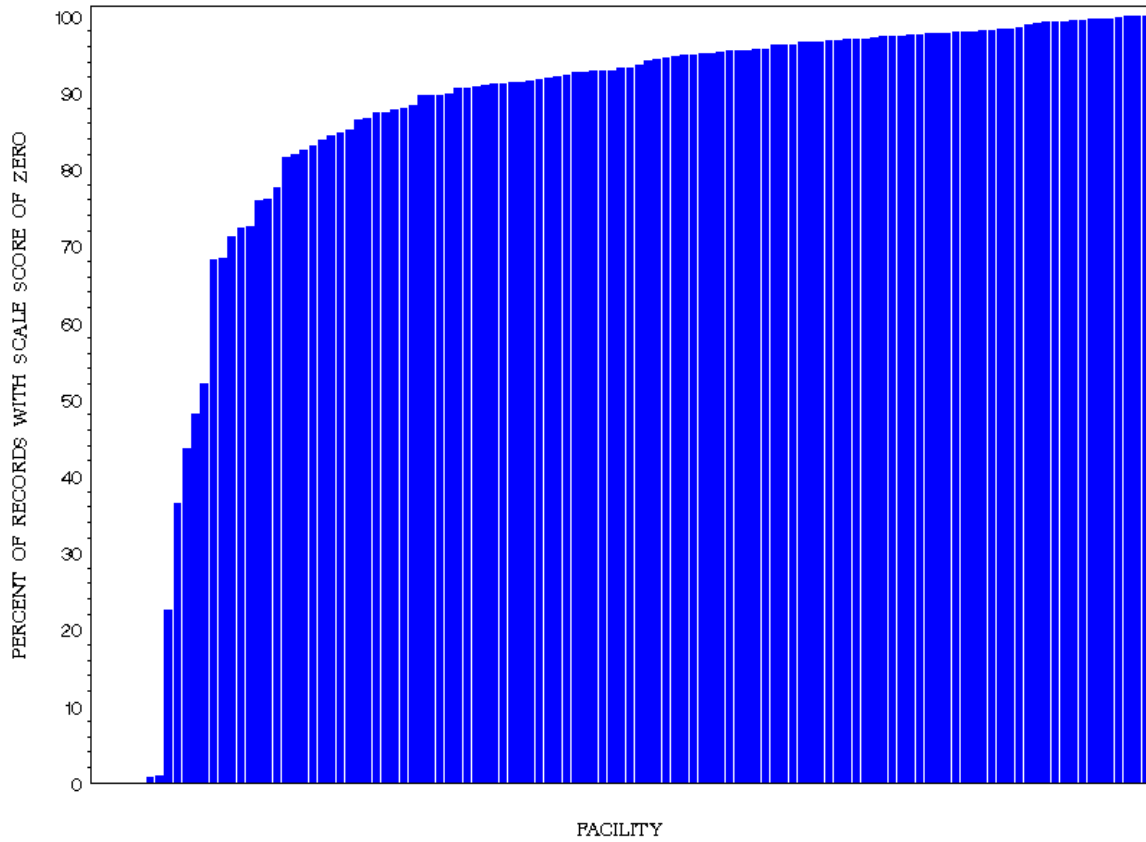


Note: For a record to be included in the annual report, the following fields must be valid and non missing: Date of Birth, Gender, E-Code, Injury Severity Score, Length of Stay, Discharge Disposition/ Discharge Status, and valid diagnosis code according to NTDB inclusion criteria.

Nine out of 111 facilities had 0% of the records qualifying, and are not visible in the graph.

Figure 36B Data completeness per facility for Level II hospitals

Proportion of records included in the annual report with a 2006 admission year from Level II hospitals

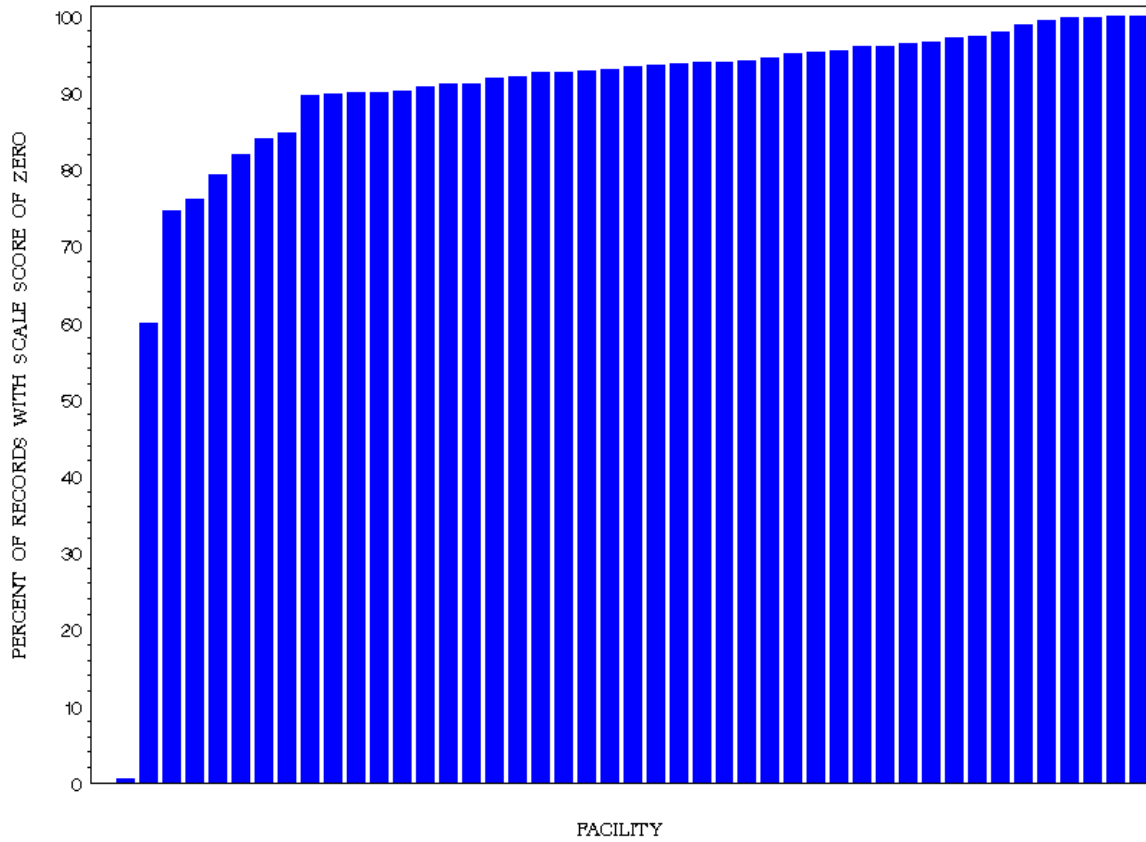


Note: For a record to be included in the annual report, the following fields must be valid and non missing: Date of Birth, Gender, E-Code, Injury Severity Score, Length of Stay, Discharge Disposition/ Discharge Status, and valid diagnosis code according to NTDB inclusion criteria.

Six out of 117 facilities had 0% of the records qualifying, and are not visible in the graph.

Figure 36C Data completeness per facility for Level III or IV hospitals

Proportion of records included in the annual report with a 2006 admission year from Level III or IV hospitals

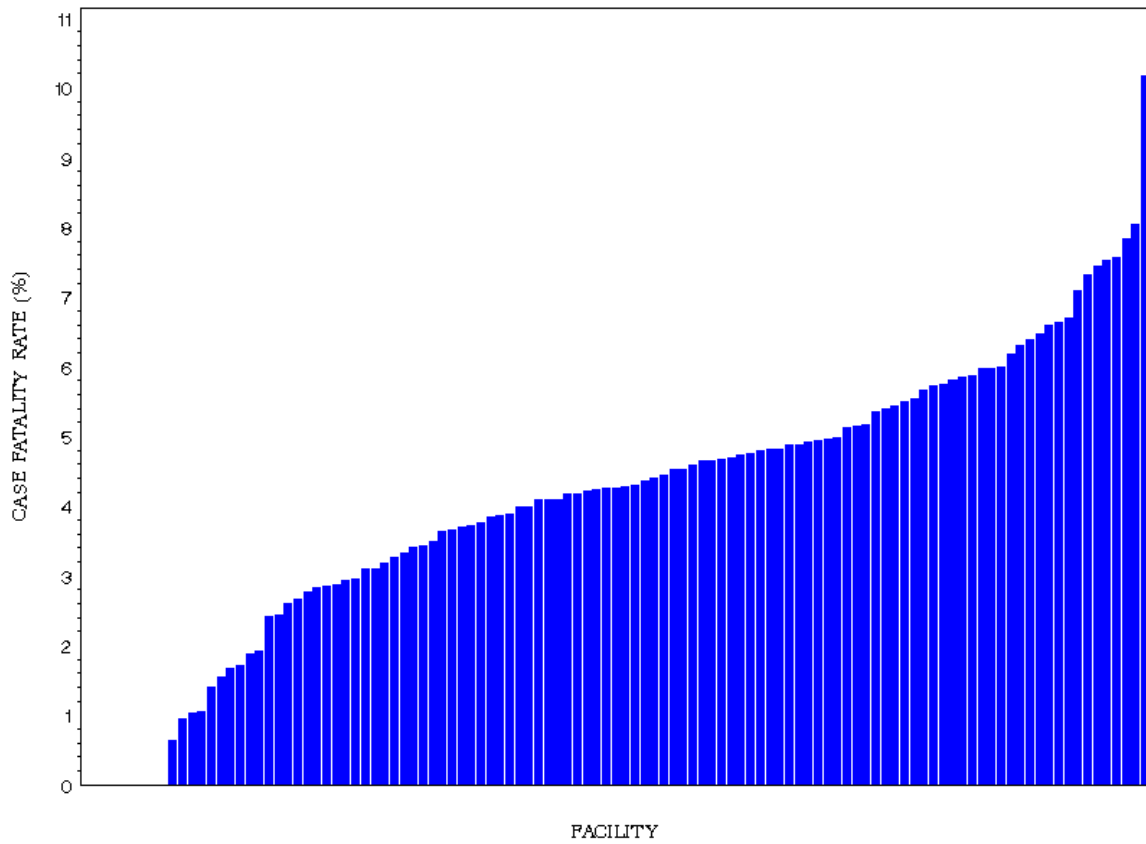


Note: For a record to be included in the annual report, the following fields must be valid and non missing: Date of Birth, Gender, E-Code, Injury Severity Score, Length of Stay, Discharge Disposition/ Discharge Status, and valid diagnosis code according to NTDB inclusion criteria.

One out of 46 facilities had 0% of the records qualifying, and are not visible in the graph.

Figure 37A Case fatality per facility for Level I hospitals

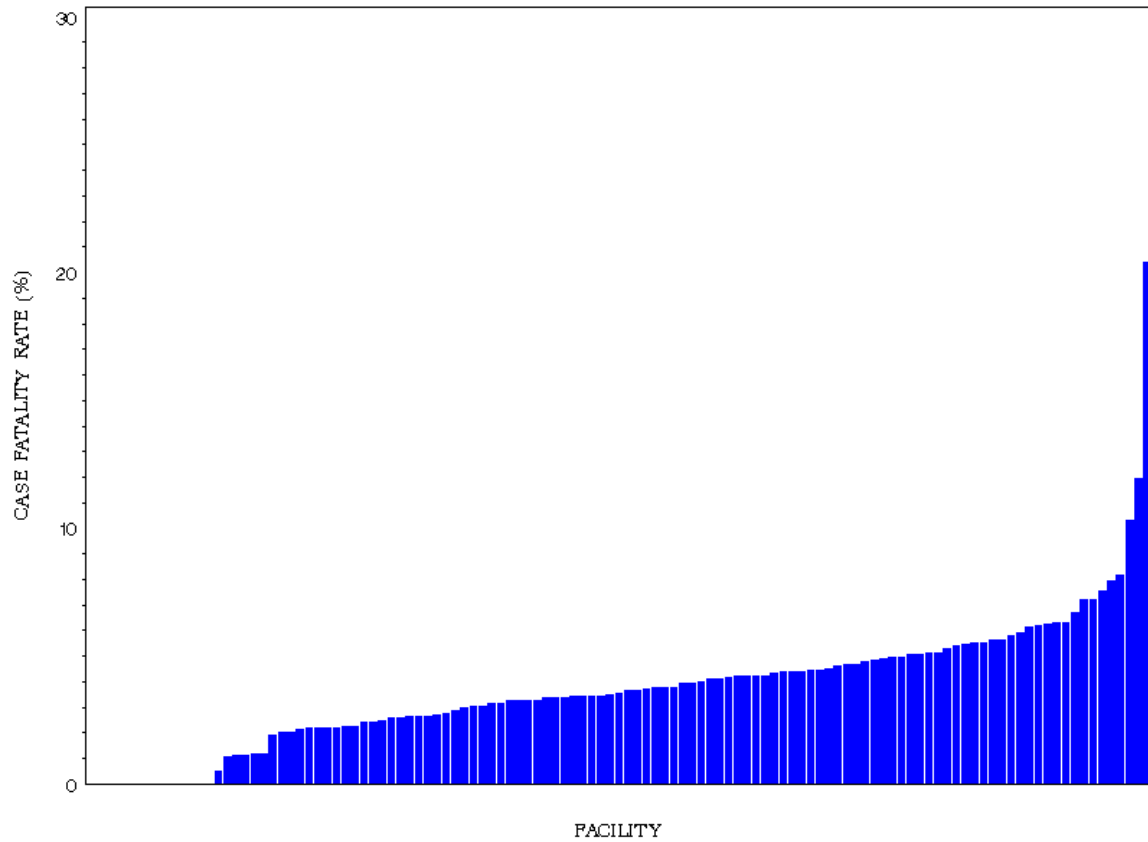
Case fatality rate (%) per facility for all records with 2006 admission year from Level I hospitals



Note: Nine out of 111 facilities reported a case fatality rate of 0 %, and are not visible on the graph.

Figure 37B Case fatality per facility for Level II hospitals

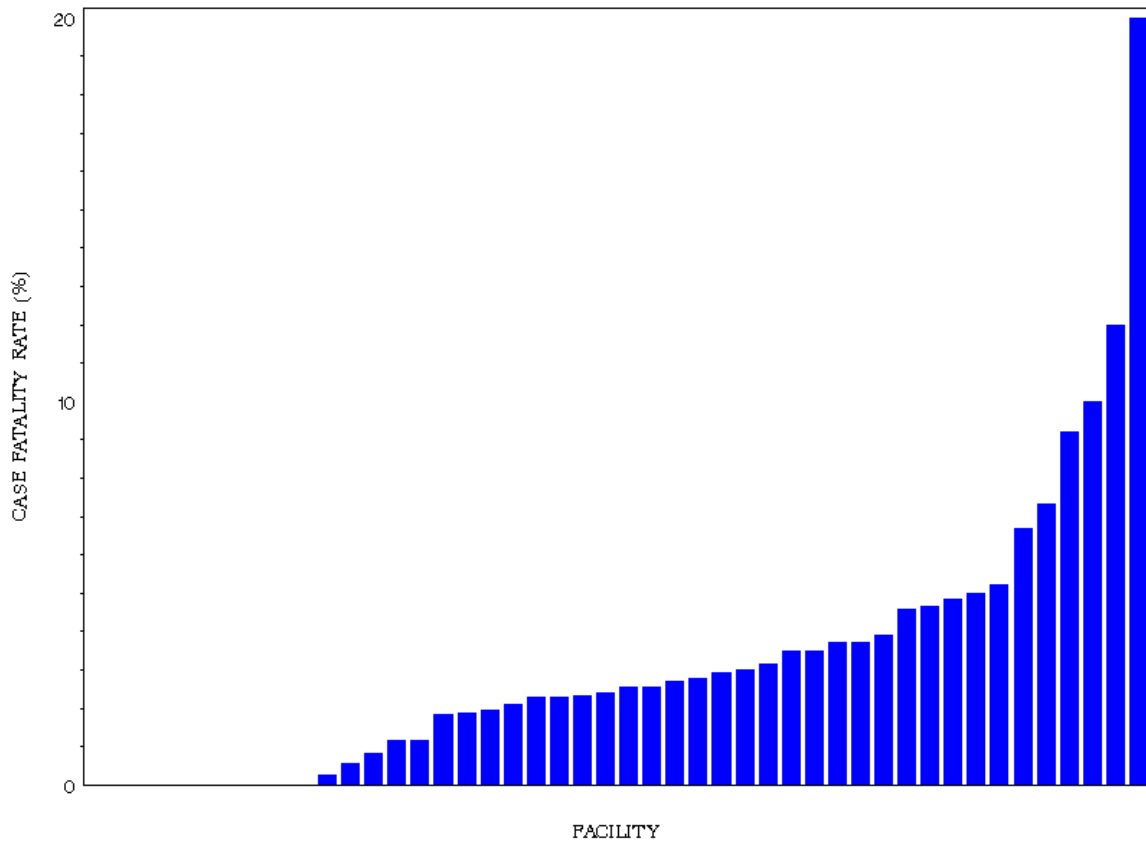
Case fatality rate (%) per facility for all records with a 2006 admission year from Level II hospitals



Note: Fourteen out of 117 facilities reported a case fatality rate of 0%, and are not visible in the graph.

Figure 37C Case fatality per facility for Level III, IV or V hospitals

Case fatality rate (%) per facility for all records with a 2006 admission year from Level III, or IV hospitals



Note: Ten out of 46 facilities reported a case fatality rate of 0%, and are not visible in the graph.

Appendix A
Definition of Trauma Patient

Definition of Trauma Patient adopted by NATIONAL TRAUMA DATA BANK (NTDB)*

All patients with ICD-9-CM discharge diagnosis 800.00–959.9

- Excluding 905–909 (late effects of injury)
- Excluding 910–924 (blisters, contusions, abrasion, and insect bites)
- Excluding 930–939 (foreign bodies)

AND

Who were admitted

OR

Who died after receiving any evaluation or treatment or were dead on arrival

OR

Who transferred into or out of the hospital.

* Definition of trauma patient was generated from the Resources for Optimal Care of the Injured Patients: 1999 by Committee on Trauma of the American College of Surgeons.

Appendix B
NTDB Data Elements

The following is a listing of NTDB data elements. For more detailed field information, please see the NTDB Data Submission File Format, located on the NTDB Web site at www.ntdb.org.

FACILITY PROFILE RECORD

- ACS Verification Level
- State Designation
- Number of Adult Hospital Beds
- Number of Pediatric Hospital Beds
- Number of Burn Hospital Beds
- Number of ICU Beds Available for Trauma Patients
- Number of ICU Beds Available for Burn Patients
- Hospital Teaching Status
- Hospital Type

INCIDENT COMPLICATION RECORD

- Complication Code
- Complication Description

INCIDENT DEMOGRAPHICS RECORD

- Date of Birth
- Age
- Gender
- Race/Ethnicity
- Principal Payment Source

INCIDENT DIAGNOSIS RECORD

- ICD-9-CM Code of Diagnosis
- Description of ICD-9-CM Code of Diagnosis
- ICD-9-CM Effective Date
- AIS Full Code of Diagnosis
- Description of AIS Code of Diagnosis
- AIS Effective Year
- AIS Severity Score
- AIS Revision

INCIDENT DIAGNOSIS STATISTICS RECORD

- Total Injury Severity Score
- TRISS Survival Probability

INCIDENT EMERGENCY DEPARTMENT RECORD

- First Recorded Date of Patient's Arrival at Reporting Hospital ED
- First Recorded Time of Patient's Arrival at Reporting Hospital ED
- Was Trauma Surgeon Arrival in ED Timely?
- First Systolic Blood Pressure in ED
- First Unassisted Respiratory Rate in ED
- Respiratory Rate Assessment Qualifier in ED
- First Temperature in ED
- Temperature Scale
- Head CT Results
- Abdominal Evaluation
- Abdominal Evaluation Type
- Base Deficit/Excess in ED
- Lowest Glasgow Eye Component in ED
- Lowest Glasgow Verbal Component in ED

Lowest Glasgow Motor Component in ED
GCS Assessment Qualifier in ED
Glasgow Coma Scale Total in ED
Revised Trauma Score in ED
Alcohol Present in Blood?
Drugs Present?
Admitting Service
Emergency Department Disposition

INCIDENT INTER-HOSPITAL TRANSFER RECORD

Inter-Hospital Transfer

INCIDENT INTUBATION RECORD

Intubation Location Indicator
Intubation Type

INCIDENT OUTCOME RECORD

Length of Stay in Hospital
Days of Total Stay in ICU
Ventilator Support Days
FIM Self-Feeding Score at Discharge
Status of FIM Self-Feeding Score
FIM Locomotion Score at Discharge
Status of FIM Locomotion Score
FIM Expression Score at Discharge
Status of FIM Expression Score
Total FIM Score
Date of Discharge or Death
Discharge Disposition
Billed Hospital Charges
Discharge Status

INCIDENT PRE-EXISTING COMORBIDITY FACTORS RECORD

Comorbidity Factor Code
Comorbidity Description

INCIDENT PREHOSPITAL PROCEDURES RECORD

Prehospital Procedure

INCIDENT PROCEDURE RECORD

ICD-9-CM Code of Procedure
Description of ICD-9-CM Code of Procedure
ICD-9-CM Effective Date
CPT-4 Code of Procedure
Description of CPT-4 Code of Procedure
CPT-4 Effective Year
Date on Which Procedure Occurred
Time at Which Procedure Occurred
Number of Days After Arrival Procedure Was Done
Number of Hours After Arrival Procedure Was Done
Number of Minutes After Arrival Procedure Was Done

INCIDENT SAFETY EQUIPMENT RECORD

Safety Equipment Used

INCIDENT SCENE RECORD

Site at Which Injury Occurred
Work Relatedness of Injury
E-Code
E-Code Description
Lowest Glasgow Eye Component at the Scene
Lowest Glasgow Verbal Component at the Scene
Lowest Glasgow Motor Component at the Scene
GCS Assessment Qualifier at the Scene
Glasgow Coma Scale Total at the Scene
Date on Which Injury Occurred
Days Between Injury and Admission
Country in Which Injury Occurred
Injury Type

Appendix C
NTDB Data Quality

The NTDB Committee Data Quality Work Group has developed the National Trauma Data Bank Reference Manual. This manual is a resource for researchers as they use the database, helping them to evaluate the NTDB as a tool for research and providing information on the current limitations of the NTDB. The manual is available on the ACS Web site at www.ntdb.org. Records were excluded from the analysis for this report if they contained missing and/or invalid values for any of the following items:

1. Date of Birth
2. Gender
3. E-Code
4. Injury Severity Score
5. Length of Stay
6. Discharge Disposition/ Discharge Status
7. Valid diagnosis code according to NTDB inclusion criteria

In addition, NTDB data records were screened for the following field-specific edit checks. Records were not excluded from analysis (unless also listed above) based on the following checks, but were flagged in the dataset if they failed the check:

Flag No	Data Field	Edit Check
1	Date of Birth	Year of Birth must be non-missing and less than or equal to Date of Admission. Year of Birth plus 120 must not be greater than Year of Admission.
2	Gender	Gender must be non-missing and Male or Female.
3	E-Code	The E-code record must be non-missing or and cannot be E849.x
4	Injury Severity Score	ISS must be non-missing, an integer between 0 and 75, and the sum of three squares.
5	Length of Stay	Length of Stay must be non-missing and an integer between 0 to 364.
6	Discharge Disposition/Discharge Status	Discharge Disposition and Discharge Status must be non-missing and consistent (Alive/Died). Records with Discharge Disposition of "Other" or "Unknown" are not flagged.
7	Valid Trauma Diagnosis Code (ICD-9 Code or AISCODE)	All patients with ICD-9-CM discharge diagnosis 800.00 – 959.9, excluding 905-909, 910-924, and 930-939. Or any non-missing AIS code.
8	Hospital Length of Stay < ICU length of stay	The Length of ICU stay must be non-missing and less than or equal to the Hospital Length of Stay.
9	Year of Admission	Year of Admission must be non-missing and greater than or equal to 1993.
10	Date of Injury	Date of Injury must be non-missing and less than or equal to Date of Admission.
11	ED Arrival Time	ED Arrival Time must be non-missing, based on 24-hour clock from 00:00 to 23:59, and with valid entries for hour and minute.
12	Initial ED systolic blood pressure	Initial ED systolic blood pressure must be non-missing and an integer between 0 and 299.

Flag No	Data Field	Edit Check
13	Initial ED respiratory rate	Initial ED Respiratory Rate must be non-missing and an integer between 0 and 59. Missing
14	ED Disposition	If ED disposition is equal to DOA, then final hospital disposition must be DOA and must have Initial ED Systolic Blood Pressure = 0, Initial ED Respiratory Rate = 0. In addition, missing ED disposition are flagged.
15	Discharge or Death Date	Date of Discharge or Death must be non-missing and greater than or equal to Date of Admission.
16	Lowest Glasgow Coma Scale Eye component in ED	Glasgow Coma Scale Eye component must be non-missing and an integer between 1 and 4.
17	Lowest Glasgow Coma Scale Verbal component in ED.	Glasgow Coma Scale Verbal component must be an integer between 1 and 5. If Glasgow Coma Scale qualifier indicates patient intubated then GCS Verbal must be missing. However, if qualified does not indicate patient intubated then missing will be flagged.
18	Lowest Glasgow Coma Scale Motor component in ED	Glasgow Coma Scale Motor component must be non-missing and an integer between 1 and 6
19	Glasgow Coma Scale Qualifier	Glasgow Coma Scale qualifier must be non-missing and equal to T (intubated), TP (intubated and chemically paralyzed), S (chemically sedated), or L (legitimated value).
20	Number of Days to Admission	Number of Days to admission must be non-missing and an integer between 0 and 30.
21	Probability of Survival	Probability of Survival must be non-missing and a value between 0 and 1.
22	Ventilator Days	Ventilator Days must be non-missing and less than or equal to the Hospital Length of Stay.
23	FIM locomotion score at discharge	FIM locomotion score must be non-missing and an integer between 0 and 4.
24	FIM expression score at discharge	FIM expression score must be non-missing and an integer between 0 and 4.
25	FIM Score Total at discharge	Total FIM must be non-missing and an integer between 1 and 12.
26	FIM self-feeding score at discharge	FIM self-feeding score must be non-missing and an integer between 0 and 4.
27	Glasgow Coma Scale Total	Glasgow Coma Scale Total must be non-missing and sum of Glasgow Coma Scale Eye, Verbal, and Motor component. If one of the components are missing then the value is flagged since the total score is invalid.

Appendix D
E-Code Grouping

Recommended Framework for E-Code Groupings for Presenting Injury Mortality and Morbidity Data. Reference MMWR 1997;46:1-30.

Mechanism/Cause	Manner/Intent				
	Unintentional	Self-inflicted	Assault	Undetermined	Other ¹
Cut/pierce	E920.0-9	E956	E966	E986	E974
Drowning/submersion	E830.0-9, E832.0-9 E910.0-9	E954	E964	E984	
Fall	E880.0-E886.9, E888	E957.0-9	E968.1	E987.0-9	
Fire/burn	E890.0-E899, E924.0-9	E958.1,.2,.7	E961, E968.0,.3	E988.1,.2,.7	
Fire/flare	E890.0-E899	E958.1	E968.0	E988.1	
Hot object/substance	E924.0-9	E958.2,.7	E961, E968.3	E988.2,.7	
Firearm	E922.0-.3,.8, .9	E955.0-4	E965.0-4	E985.0-4	E970
Machinery	E919 (.0-9)				
Motor vehicle traffic ^{2,3}	E810-E819 (.0-9)	E958.5	E968.5	E988.5	
Occupant	E810-E819 (.0,.1)				
Motorcyclist	E810-E819 (.2,.3)				
Pedal cyclist	E810-E819 (.6)				
Pedestrian	E810-E819 (.7)				
Unspecified	E810-E819 (.9)				
Pedal cyclist, other	E800-E807 (.3) E820-E825 (.6), E826.1,.9 E827-E829(.1)				
Pedestrian, other	E800-807(.2) E820-E825(.7) E826-E829(.0)				
Transport, other	E800-E807 (.0,.1,.8,.9) E820-E825 (.0-.5,.8,.9) E826.2-8 E827-E829 (.2-9), E831.0-9, E833.0-E845.9	E958.6		E988.6	
Natural/environmental	E900.0-E909, E928.0-2	E958.3		E988.3	
Bites and stings ³	E905.0-.6,.9 E906.0-4,.5,.9				
Overexertion	E927				
Poisoning	E850.0-E869.9	E950.0- E952.9	E962.0-9	E980.0- E982.9	E972
Struck by, against	E916-E917.9		E960.0; E968.2		E973, E975
Suffocation	E911-E913.9	E953.0-9	E963	E983.0-9	
Other specified and classifiable ⁴	E846-E848, E914-E915 E918, E921.0-9, E922.4,5 E923.0-9, E925.0-E926.9 E928.3, E929.0-5	E955.5,.6,.7,.9 E958.0,.4	E960.1, E965.5-9 E967.0-9, E968.4,.6, .7 E979.0-9	E985.5,.6,.7 E988.0,.4	E971, E978, E990-E994, E996 E997.0-2
Other specified, not elsewhere classifiable	E928.8, E929.8	E958.8, E959	E968.8, E969	E988.8, E989	E977, E995, E997.8 E998, E999

Mechanism/Cause	Manner/Intent				
	Unintentional	Self-inflicted	Assault	Undetermined	Other ¹
Unspecified	E887, E928.9, E929.9	E958.9	E968.9	E988.9	E976, E997.9
All injury	E800–E869, E880–E929	E950–E959	E960–E969, E979	E980–E989	E970–E978, E990–E999
Adverse effects					E870–E879 E930.0–E949.9
Medical care					E870–E879
Drugs					E930.0–E949.9
All external causes					E800–E999

¹Includes legal intervention (E970–E978) and operations of war (E990–E999).

²Three 4th-digit codes (.4 [occupant of streetcar], .5 [rider of animal], .8 [other specified person]) are not presented separately because of small numbers. However, because they are included in the overall motor vehicle traffic category, the sum of these categories can be derived by subtraction.

³E968.5 (assault by transport vehicle), E906.5 (bite from unspecified animal), E922.4 (unintentional injury [gunshot wound] with BB/pellet), E955.6 (suicide attempt/intentionally Self-inflicted injury [gunshot wound] with BB/pellet gun), E968.6 (assault [gunshot wound] with BB/pellet gun), E985.6 (undetermined intent injury [gunshot wound] with BB/pellet gun), E928.3 (unintentional human bite), and E968.7 (assault by human bite), are specific to the *ICD-9-CM* and, therefore, only apply to morbidity coding.

⁴E849 (place of occurrence) has been excluded from the matrix. For mortality coding, an *ICD-9* E849 code does not exist. For morbidity coding, an *ICD-9-CM* E849 code should never be first— the listed E-code and should only appear as an additional code to specify the place of occurrence of the injury incident.

Note: ICD-9 E-codes for coding underlying cause of death apply to injury— related death data from 1979 through 1998. Then there is a new ICD-10 external cause of injury matrix that applies to death data from 1999 and after. This can be found on the [National Center for Health Statistics Web site](http://www.cdc.gov/nchs/nhanes/).

Appendix E
Participating Hospitals

Participating hospitals are defined as hospitals that have submitted data to NTDB with ED admission year of 2002 – 2006.

STATE / FACILITY NAME	Data submitted in 2007
ALABAMA	
Children's Hospital of Alabama	*
Crestwood Medical Center	
DCH Regional Medical Center	*
Huntsville Hospital	
Northeast Alabama Regional Medical Center	
Northport Medical Center	
University Hospital	*
University of South Alabama Children's and Women's Hospital	
University of South Alabama Medical Center	*
Walker Baptist Medical Center	
ALASKA	
Alaska Native Medical Center	*
Alaska Regional Hospital	
Alaska State Department of Health	
Bartlett Regional Hospital	
Bassett Army Community Hospital	
Central Peninsula General Hospital	
Cordova Community Medical Center	
Elmendorf Regional Medical Center	
Fairbanks Memorial Hospital	
Kanakanak Hospital	
Ketchikan General Hospital	
Maniilaq Health Center	
Mat-Su Medical Center	
Norton Sound Regional Hospital	
Petersburg Medical Center	
Providence Alaska Medical Center	
Providence Kodiak Island Medical Center	
Providence Seward Medical Center	
Samuel Simmonds Memorial Hospital	
SEARHC Mt. Edgecumbe Hospital	
Sitka Community Hospital	
South Peninsula Hospital	
Valdez Community Hospital	
Wrangell Medical Center	
Yukon-Kuskokwim Delta Regional Hospital	
ARIZONA	
Banner Good Samaritan Medical Center	*
Flagstaff Medical Center	*
John C. Lincoln Hospital, North Mountain	
Maricopa Integrated Health Systems	*

STATE / FACILITY NAME**Data submitted in 2007**

Scottsdale Healthcare - Osborn *
 St. Joseph's Hospital and Medical Center *

ARKANSAS

Arkansas Children's Hospital *
 UAMS Medical Center
 White River Medical Center

CALIFORNIA

Arrowhead Regional Medical Center *
 Biggs-Gridley Hospital *
 California Hospital Medical Center *
 Cedars-Sinai Medical Center *
 Children's Hospital Los Angeles *
 Colusa Regional Medical Center *
 Community Regional Medical Center *
 Eden Hospital *
 Enloe Medial Center *
 Fairchild Medical Center *
 Glenn Medical Center *
 Harbor/UCLA Medical Center *
 Henry Mayo Newhall Memorial Hospital *
 Highland Hospital *
 Huntington Memorial Hospital *
 John Muir Medical Center *
 LAC+USC Medical Center *
 Long Beach Memorial Medical Center *
 Los Angeles County Ems Agency
 Martin Luther King / Drew Medical Center
 Mayers Memorial Hospital *
 Mercy Medical Center, Mt. Shasta *
 Mercy Medical Center, Redding *
 Mercy San Juan Medical Center *
 Mission Hospital Regional Medical Center *
 Northridge Hospital Medical Center *
 Oroville Hospital *
 Palomar Medical Center *
 Providence Holy Cross Medical Center *
 Riverside County Regional Medical Center *
 Saint Francis Medical Center *
 Saint Mary Medical Center *
 San Francisco General Hospital *
 San Jose Medical Center
 Santa Barbara Cottage Hospital *
 Santa Clara Valley Medical Center
 Santa Rosa Memorial Hospital *
 Scripps Memorial Hospital
 Scripps Mercy Hospital *
 Seneca District Hospital *

STATE / FACILITY NAME**Data submitted in 2007**

Sharp Memorial Hospital	*
Shasta Regional Medical Center	*
St. Elizabeth Community Hospital	*
Stanford Hospital & Clinics	
Sutter Roseville Medical Center	*
UCLA Medical Center	*
UCSD Medical Center	*
University Of California Davis Medical Center	*
University Of California Irvine Medical Center	*
Western Medical Center-SA	*

COLORADO

Denver Health Medical Center	*
Penrose Hospital	*
Poudre Valley Hospital	*
Swedish Medical Center	*

CONNECTICUT

Bridgeport Hospital	*
Connecticut Children's Medical Center	*
Danbury Hospital	*
Hartford Hospital	*
Hospital of Saint Raphael	*
New Milford Hospital	*
Norwalk Hospital	*
Saint Francis Hospital And Medical Center	*
Saint Mary's Hospital	*
Saint Vincent's Medical Center	*
Stamford Hospital	*
Yale-New Haven Hospital	*

DELAWARE

Alfred I. DuPont Hospital for Children	*
Bayhealth Medical Center - Kent Campus	*
Beebe Medical Center	*
Christiana Hospital	*
Delaware Office of EMS	
Milford Memorial Hospital	*
Nanticoke Memorial Hospital	*
Wilmington Hospital	*

DISTRICT OF COLUMBIA

Washington Hospital Center	*
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FLORIDA

All Children's Hospital	
Baptist Hospital	*
Bayfront Medical Center	
Broward General Medical Center	

STATE / FACILITY NAME

Data submitted in 2007

Halifax Medical Center	
Holmes Regional Medical Center - Health First	*
Holmes Regional Trauma Center	*
Lakeland Regional Medical Center	*
Memorial Regional Hospital	*
North Broward Medical Center	
Orlando Regional Healthcare	
Sacred Heart Health Systems	*
St. Joseph's Hospital	*
Tampa General Hospital	*
West Florida Hospital	

GEORGIA

Athens Regional Medical Center	*
Atlanta Medical Center	*
Children's Healthcare of Atlanta at Egleston	*
Children's Healthcare of Atlanta of Scottish Rite	
Columbus Regional Healthcare System, Inc	*
DeKalb Medical Center	*
Floyd Medical Center	*
Georgia State Office Of EMS/Trauma	*
Grady Memorial Health	*
Gwinnett Medical Center	*
Hamilton Medical Center	*
John D. Archbold Memorial Hospital	*
Medical Center of Central Georgia	*
Medical College of Georgia	*
Memorial Health University Medical Center	*
Morehouse Medical Clinic	
Morgan Memorial Hospital	*
North Fulton Regional Hospital	*
Phoebe Putney Memorial Hospital	*
Southern Regional Medical Center	
Stewart Webster Hospital	
Walton Medical Center	*

HAWAII

The Queen's Medical Center	
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IDAHO

Eastern Idaho Regional Medical Center	*
Magic Valley RMC	
Portneuf Medical Center	
Saint Alphonsus Regional Med Center	

ILLINOIS

Illinois Department of Public Health - AMSS	
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INDIANA

STATE / FACILITY NAME**Data submitted in 2007**

Elkhart General Hospital	*
Memorial Hospital Of South Bend	*
Parkview Hospital	*
Riley Hospital For Children	*
Saint Joseph's Regional Medical Center	*
St. Mary's Medical Center	*
Wishard Memorial Hospital	*

IOWA

Alegent Health Community Memorial Hospital	
Alegent Health Mercy	
Allen Memorial Hospital	
Broadlawns Medical Center	
Cass Country Memorial Hospital	
Covenant Medical Center	
Crawford County Memorial Hospital	
Dickinson County Memorial Hospital	
Floyd County Memorial Hospital	
Fort Madison Community Hospital	
Franklin General Hospital	
Genesis Medical Center	
Great River Medical Center	
Greene County Medical Center	
Grinnell Regional Medical Center	
Hamilton County Hospital	
Hawarden Community Hospital	
Hegg Memorial Health Center	
Henry County Health Center	
Iowa Department of Public Health	*
Iowa Lutheran Hospital	
Iowa Methodist Medical Center	
Jennie Edmundson Hospital	
Keokuk Area Hospital	
Knoxville Area Community Hospital	
Loring Hospital	
Lucas County Health Center	
Mahaska County Hospital	
Manning Regional Healthcare Center	
Marshalltown Medical Surgical Center	
Mary Greeley Medical Center	
Mercy Iowa City	
Mercy Medical Center	
Mercy Medical Center - Cedar Rapids	
Mercy Medical Center - Des Moines	
Mercy Medical Center - Dubuque	
Mercy Medical Center - North Iowa	
Mercy Medical Center - Sioux City	
Montgomery County Memorial Hospital	
Orange City Health System	

STATE / FACILITY NAME

Data submitted in 2007

Ottumwa Regional Health Center
 Palmer Lutheran Health Center
 Saint Luke's Hospital
 Saint Luke's Regional Medical Center
 Sartori Hospital
 Shenandoah Medical Center
 Sioux Center Community Hospital
 Skiff Medical Center
 Stewart Memorial Community Hospital
 Trinity Medical Center- North Campus
 Trinity Regional Hospital
 University of Iowa Health Care
 Veterans Memorial Hospital
 Virginia Gay Hospital
 Washington County Hospitals and Clinics
 Waverly Municipal Hospitals
 Winneshiek County Memorial Hospital

KANSAS

HCA Wesley Medical Center *
 Kansas State Department of Health *
 Kansas Trauma Registry *
 Overland Park Regional Medical Center *
 Stormont-Vail Health Care *
 University of Kansas Hospital *
 Via Christi Regional Medical Center - St. Francis Campus *

KENTUCKY

Kosair Children's Hospital *
 Taylor Regional Hospital *
 Trover Regional Medical Center - Madisonville
 University of Kentucky Health Care
 University of Louisville Hospital

LOUISIANA

Medical Center of Louisiana *

MAINE

Central Maine Medical Center *
 Eastern Maine Medical Center *
 Maine Medical Center

MARYLAND

John Hopkins Bayview Medical Center *
 R Adams Cowley Shock Trauma Center *
 Washington County Health System *

MASSACHUSETTS

Anna Jaques Hospital *

STATE / FACILITY NAME**Data submitted in 2007**

Baystate Medical Center	*
Berkshire Medical Center	
Beth Israel Deaconess Medical Center	*
Boston Medical Center	*
Brigham and Women's Hospital	*
Children's Hospital Boston	
Falmouth Hospital	*
Floating Hospital for Children at Tufts	*
Lahey Clinic	*
Lawrence General Hospital	*
Massachusetts General Hospital	*
New England Medical Center	*
South Shore Hospital	*
UMass Memorial Health Care	*

MICHIGAN

Borgess Medical Center	*
Bronson Methodist Medical Center	*
Covenant Health Care	*
Detroit Receiving Hospital	
Genesys Regional Medical Center	*
Hackley Hospital	*
Henry Ford Hospitals	*
Hurley Medical Center	*
Marquette General Health System	*
McLaren Regional Medical Center	
Mott Children's Hospital-University Of Michigan	
Munson Medical Center	
Pontiac Osteopathic Hospital Medical Center	*
Portage Health Systems	*
Saint Mary's Health Care	*
Sparrow Health System	*
Spectrum Health	*
St. John Medical Center	*
St. Joseph Mercy Hospital	*
St. Mary's of Michigan	*
University of Michigan Trauma Burn Center	
William Beaumont Hospital	*

MINNESOTA

Hennepin County Medical Center	
Mayo Clinic Rochester, Saint Mary's Hospital	*
Mercy Hospital	
Minnesota State Department Of Health	
North Memorial Medical Center	
Regions Hospital	
St. Cloud Hospital	
St. Luke's Hospital	
St. Mary's Medical Center	

STATE / FACILITY NAME

Data submitted in 2007

MISSISSIPPI

Mississippi Department of Health *

University of Mississippi Medical Center *

MISSOURI

Barnes-Jewish Hospital *

Freeman Health System *

Missouri Department Of Health *

New Liberty Hospital District *

North Kansas City Hospital *

Saint Francis Medical Center *

Saint Luke's Hospital Of Kansas City *

St. John's Health System *

St. John's Mercy Medical Center *

St. Louis Children's Hospital *

St. Louis University Hospital *

Truman Medical Center *

University of Missouri Healthcare *

MONTANA

Community Medical Center *

Deaconess Billings Clinic *

Kalispell Regional Medical Center *

Saint Vincent Healthcare *

NEBRASKA

BryanLGH Medical Center West *

Creighton University Medical Center *

Good Samaritan Hospital *

Great Plains Regional Medical Center *

Regional West Medical Center *

Saint Francis Medical Center *

The Nebraska Medical Center *

NEVADA

Renown Regional Medical Center *

Sunrise Hospital/Sunrise Children's Hospital *

University Medical Center *

NEW HAMPSHIRE

Dartmouth-Hitchcock Medical Center *

Parkland Medical Center *

NEW JERSEY

Atlanticare Regional Medical Center *

Capital Health System at Fuld Campus *

Cooper Hospital Trauma Center *

STATE / FACILITY NAME	Data submitted in 2007
Hackensack University Medical Center	*
Jersey Shore University	*
Jersey City Medical Center	*
Morristown Memorial Hospital	*
NJ Trauma Center	*
Robert Wood Johnson University Hospital	*
NEW MEXICO	
University Of New Mexico Hospital	*
NEW YORK	
Bellevue Hospital	
Brookhaven Memorial Hospital	*
Harlem Hospital Center	
Jacobi Medical Center	*
New York Presbyterian Hospital/Weill Cornell	
North Shore University Hospital	*
St. Elizabeth Medical Center	*
Stony Brook University Medical Center	*
Strong Memorial Hospital	*
United Health Services	*
University Hospital	*
NORTH CAROLINA	
Carolinas Medical Center	*
Cleveland Regional Medical Center	*
Duke University Medical Center	*
Forsyth Medical Center	
Mission Hospital	*
Moses H. Cone Hospital	
UHS of Eastern Carolina - Pitt County Memorial Hospital	*
UNC Hospitals	*
Wake Forest University Baptist Medical Center	*
Wake Medical Center - Wakemed	*
NORTH DAKOTA	
Altru Hospital	*
Ashley Medical Center	*
Cavalier Country Memorial Hospital	*
Community Memorial Hospital	*
Garrison Memorial Hospital	*
Heart of America Medical Center	*
Hillsboro Medical Center	*
Innovis Health	*
Jamestown Hospital	*
Lisbon Area Health Services	*
Medcenter One	*
Mercy Hospital, Valley City	*
Mercy Medical Center, Williston	*

STATE / FACILITY NAME**Data submitted in 2007**

Pembina County Memorial Hospital	*
Quentin Burdick IHF Belcourt Hospital	*
St. Alexius Medical Center	*
St. Aloisius Medical Center	*
St. Andrews Health Center	*
St. Josephs Hospital and Health Center	*
Tioga Medical Center	*
Trinity Hospitals	*
Union Hospital	*
West River Medical Center	*
Wishek Community Hospital	*

OHIO

Akron Children's Hospital	*
Akron City Hospital	*
Central Ohio Trauma System	*
Children's Hospital, Inc.	
Children's Medical Center	*
Cincinnati Children's Hospital Medical Center	*
Community Hospital of Springfield	*
East Ohio Regional Hospital	*
Fairview Hospital	*
Good Samaritan Hospital	*
Grandview Hospital	*
Greene Memorial Hospital	*
Huron Hospital	*
Kettering Memorial Hospital	*
Lakewood Hospital	*
Medcentral Health Systems	*
Mercy Medical Center	*
Mercy Memorial Hospital	*
Medical University Of Ohio	*
Miami Valley Hospital	*
St. Joseph Health Center	*
St. Vincent Mercy Medical Center/Mercy Children's Hospital	
Sycamore Hospital	*
The Toledo Hospital	*
The University Hospital	*
University of Toledo Medical Center	*
Upper Valley Medical Center	*
Wayne Hospital	*

OKLAHOMA

OU Medical Center	*
St. John Medical Center	*

OREGON

Legacy Emanuel Hospital	*
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STATE / FACILITY NAME**Data submitted in 2007****PENNSYLVANIA**

Pennsylvania State Trauma Foundation
The Western Pennsylvania Hospitals

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PUERTO RICO

Puerto Rico Trauma Center

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RHODE ISLAND

Rhode Island Hospital

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SOUTH CAROLINA

Carolinas Hospital System
Greenville Memorial Hospital
Lexington Medical Center
McLeod Regional Medical Center
Medical University of South Carolina
Palmetto Health
Regional Medical Center of Orangeburg and Calhoun
Spartanburg Regional Healthcare System

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SOUTH DAKOTA

Avera McKennan Hospital
Avera Queen Of Peace
Sioux Valley Hospital USD Medical Center

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TENNESSEE

Blount Memorial Hospital
Bradley Memorial Hospital
Bristol Regional Medical Center
East Tennessee Children's Hospital
Erlanger Medical Center
Johnson City Medical Center
Le Bonheur Children's Medical Center
Methodist Healthcare Central
Regional Medical Center At Memphis
University Of Tennessee Medical Center
Vanderbilt University Medical Center
Wellmont-Holston Valley Medical Center

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TEXAS

Baylor University Medical Center
Brackenridge Hospital
Brooke Army Medical Center
Children's Medical Center of Dallas
Cook Children's Medical Center
Covenant Children's Hospital
Covenant Medical Center
East Texas Medical Center
Harris Methodist Fort Worth Hospital

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STATE / FACILITY NAME	Data submitted in 2007
Hillcrest Baptist Medical Center	*
John Peter Smith Hospital	*
Methodist Dallas Medical Center	*
Parkland Health & Hospital System	*
Shannon Medical Center	
Texas Children's Hospital	
Thomas General Hospital	*
University Medical Center	*
University of Texas Medical Branch @Galveston	*
Valley Baptist Medical Center	*
Wilford Hall Medical Center	*
UTAH	
LDS Hospital	
Primary Children's Medical Center	*
VERMONT	
Fletcher Allen Health Care	*
VIRGINIA	
Carilion Roanoke Memorial Hospital	*
Inova Fairfax Hospital	*
Lynchburg General Hospital	*
Medical College of Virginia Hospitals	
Riverside Regional Medical Center	*
Sentara Norfolk General Hospital	*
Sentara Virginia Beach General Hospital	*
University of Virginia Health System	*
WASHINGTON	
Washington State Department of Health	
WEST VIRGINIA	
Cabell Huntington Hospital	*
Camden-Clark Memorial Hospital	*
Charleston Area Medical Center	*
City Hospital	*
Ohio Valley Medical Center	*
St. Mary's Medical Center	*
West Virginia University Hospital	*
Wheeling Hospital	*
WISCONSIN	
Aspirus Wausau Hospital	*
Aurora Baycare Medical Center	*
Children's Hospital Of Wisconsin	*
Franciscan Skemp Healthcare	*
Froedtert Memorial Lutheran Hospital	*
Gunderson Lutheran Hospital	*

STATE / FACILITY NAME

Data submitted in 2007

Saint Joseph's Hospital

*

St. Vincent Hospital

*

Theda Clark Medical Center

*

University of Wisconsin

*

WYOMING

Wyoming Department Of Health

*

UNKNOWN STATE

Jacobson Memorial Hospital

*

McKenzie County Memorial Hospital, Watford

*

Mercy Hospital, Devils Lake

*

NorthWood Deaconess Health Center

*

Southview Hospital

*

St. Luke's Hospital, Crosby

*

Standing Rock Hospital, Fort Yates

*

Towner County Medical Center

*

Trinity Medical Center

*

CANADA

Saint Michael's Hospital

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